SAFETY STANDARDS

EN

Safety important instructions.

	***This symbol warns that failure to comply with the prescription leads to a risk of electric shocks.***
	*This symbol warns that failure to comply with the prescription leads to a risk of injury/damage to persons/objects.*

Before installation and use of the product:

- *read this manual completely and thoroughly*
- *Check that the **nameplate data** are those desired and appropriate to the system, and in particular that the **rated current of the motor** is compatible with the **rated current of the inverter***
- *Installation and maintenance must be carried out by qualified staff, responsible for performing the hydraulic and electric connections according to the applicable Standards in force*
- *The manufacturer declines all responsibility for damage deriving from improper use of the product and is not liable for damage caused by maintenance or repairs that are carried out by unqualified staff and/or using non-original spare parts*
- *The use of non-original spare parts, tampering or improper use, make the product warranty null and void.*

During first installation or when carrying out maintenance make sure that:

- ***the electric power supply network is not live***
- *The power supply network is equipped with protections and in particular of **high-sensitivity differential switch** (30 mA in class A for domestic application, class B for industrial applications) and grounding comply with the Standards.*
- ***Before removing the inverter cover** or starting interventions on it, the system must be disconnected from the mains electricity and you must wait for 5 mins until the intermediate circuit condensers, have the time to discharge via the built-in discharge resistors.*
- ***do not disconnect the pumps if STEADYPRES is in operation; before you disconnect the pumps, stop the control and disconnect the power supply.***
- *WARNING: out of service (flashing red LED) STEADYPRES remains in tension; prior to any work on the pump or inverter is required, cut off power from the group.*

Emergency stop

An emergency stop can be performed while the inverter is running, by pressing the START/STOP key.

In parallel inverters installations, only the MASTER inverter stops the whole system.

INDEX

EN

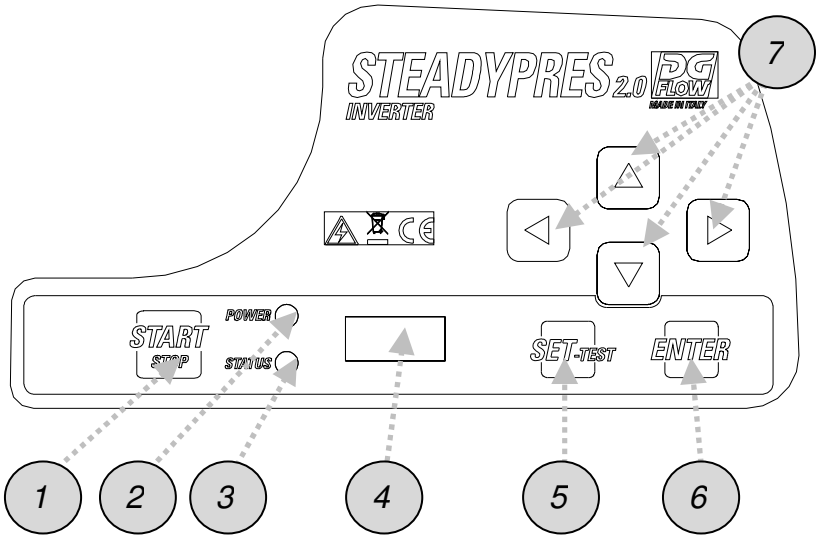
PART 1 - QUICK INSTALLATION GUIDE

PRELIMINARY CHECKS

⚠	*During the initial installation and maintenance, make **sure that ends of the line wires are not live**.*
⚠	*During the initial installation and maintenance, make sure that **the system is not under pressure***
⚠	***to ACCESS THE DRIVE WIRING**, open the front cover as shown on p. 5* ***DO NOT OPEN INVERTER COVERS**, except for the connector cover*
⚠	***Models T / T** (three-phase IN / three-phase OUT) do not have the switch on board, for these models the inverter supply line must be protected in accordance with the regulations*

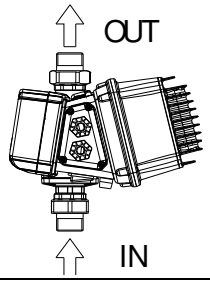
- ***Install the inverter in a place:***
  - *protected from the elements*
  - *ventilated, free from excessive humidity or excessive dust*
  - *as close as possible to the pump*
  - *make sure that does not receive harmful vibrations or mechanical stress from connected pipelines*

- ***Control panel:***



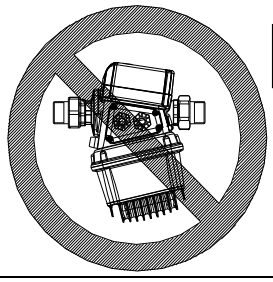
1- *START/STOP button*
2- *Red LED (power)*
3- *Green LED (status)*
4- *Display*
5- *SET button*
6- *Confirm button*
7- *Scrolling UP / DOWN / RIGHT / LEFT*

INSTALLATION AND HYDRAULIC CONNECTIONS



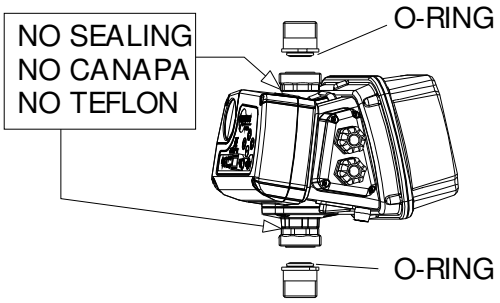
OK

*Install in a **vertical** position*

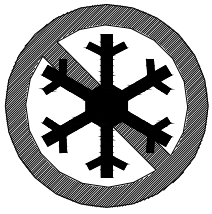


NO

***Do not** install in a horizontal position*



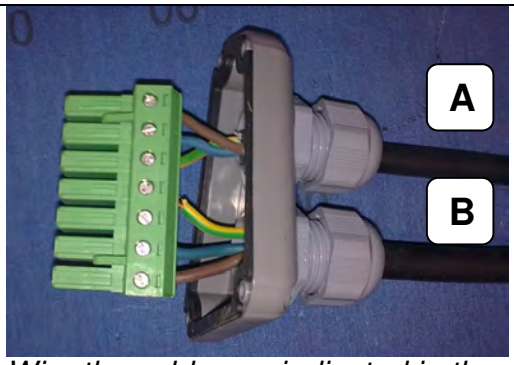
***Do not** use sealant in the three-pieces joint; are already equipped with O-Ring*



The freezing of the liquid contained in the inverter body causes irreversible damage to the inverter

POWER CONNECTIONS

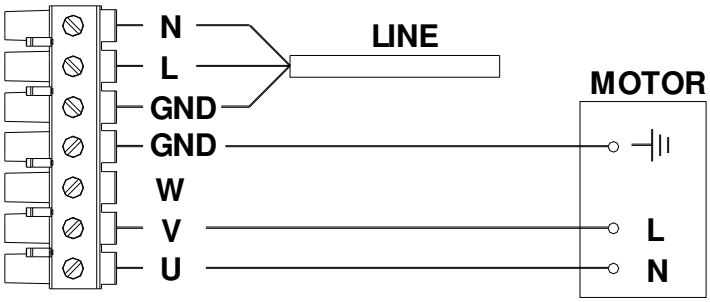
Open the side cover (4 screws)



Wire the cables as indicated in the diagrams below:
A = inverter supply cable
B = output motor cable

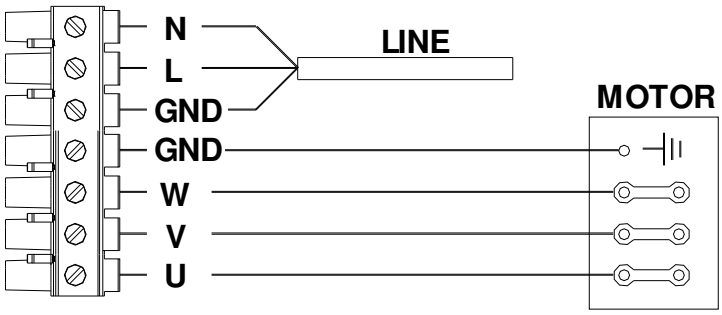
Insert the connector and close the side cover.

CAUTION : *to overcome* ***problems associated with long cables*** *(between Inverter and pump motor) , evaluate the application of inverter output sinusoidal filter. It aids smooth running of motors eliminating negative effect of voltage peaks*



SINGLE-PHASE IN (line) SINGLE-PHASE OUT (motor) (M / M)

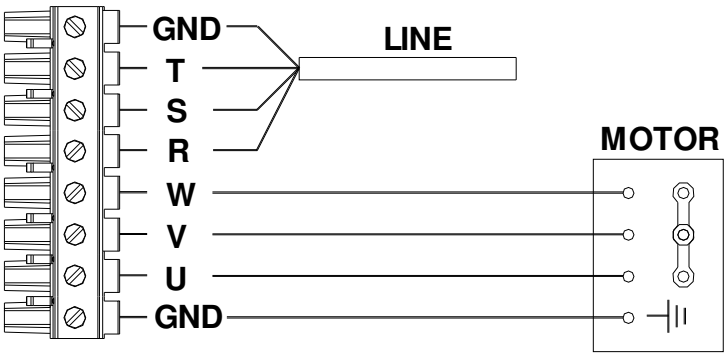
Pump supply voltage:
230 V single-phase
(or 115 V single-phase)



SINGLE-PHASE IN (line) THREE-PHASE OUT (motor) (M / T)

Pump supply voltage:
230/400 V three-phase

Motor connection : DELTA



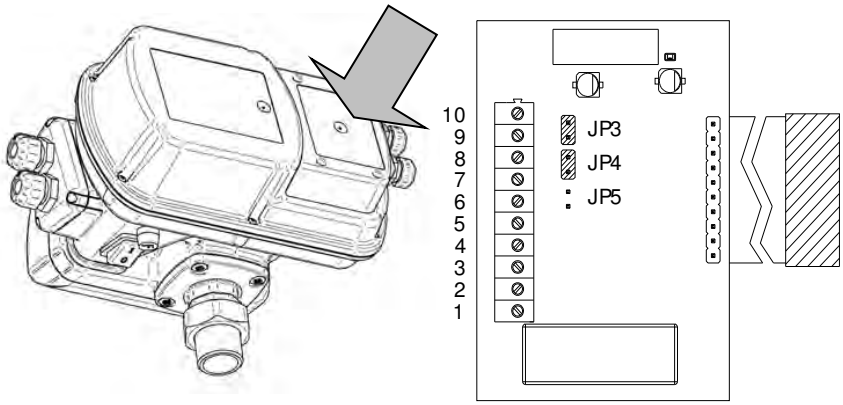
THREE-PHASE IN (line) THREE-PHASE OUT (motor) (T / T)

Pump supply voltage:
230/400 V three-phase

Motor connection : STAR

SIGNAL CONNECTIONS

Expansion board: *is located in the back of the inverter (see fig. below)*

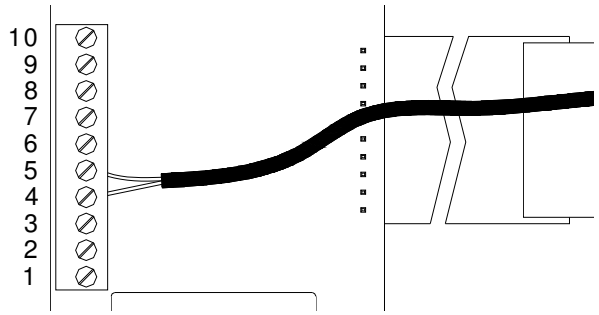


Terminal clamp operation description:

10: not connected
9: RS 485 +
8: RS 485 -
7: not connected
6: not connected
5: level input
4: GND
3: NC output signal
2: comune C
1: NO output signal

JP3: bridged, no function
JP4: bridged, no function
JP5: no function

- *LEVEL SIGNAL CONNECTION*



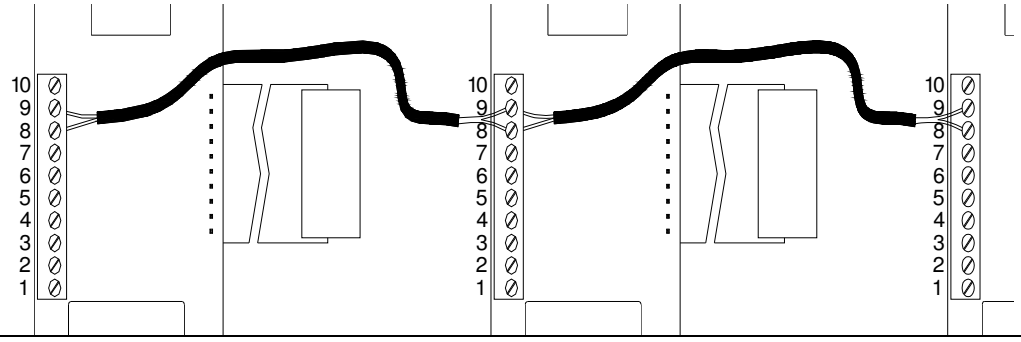
(or other input signal)

Connect the signal cable to ***clamps***

4 e 5

In applications with parallel inverters, the wiring must be carried out on the MASTER

- *RS485 SIGNAL CONNECTION*



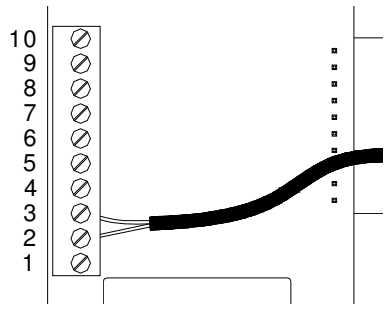
Connect the ***terminals n° 8*** *of the inverters in parallel (RS 485 –)*

Connect the ***terminals n° 9*** *of the inverters in parallel (RS 485 +)*

as shown aside.

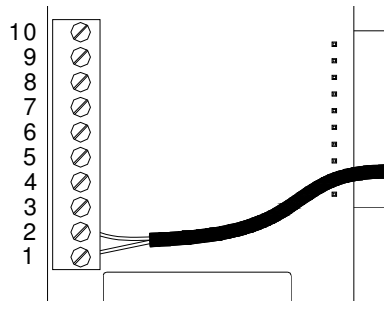
- *ALARM SIGNAL CONNECTION*

(In applications with parallel inverters, the wiring must be carried out on the MASTER)



Logic NC *(normally closed)*

Connect the signal cable to terminals 2 and 3



Logic NO *(normally open)*

Connect the signal cable to terminals 1 and 2

The maximum load for connection is 2 A at 250 Vac

STARTING UP

Switch on (the switch is not present in models T/T) and wait the STARTING time (ab. 10 sec.)

By pressing the button

START

STOP

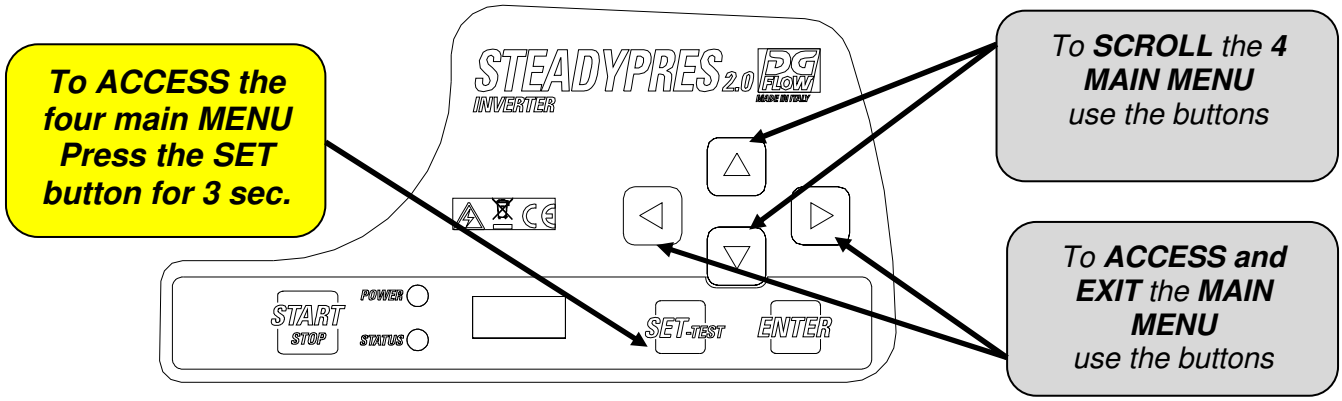
you put

IN SERVCE

OUT OF SERVICE

the inverter.

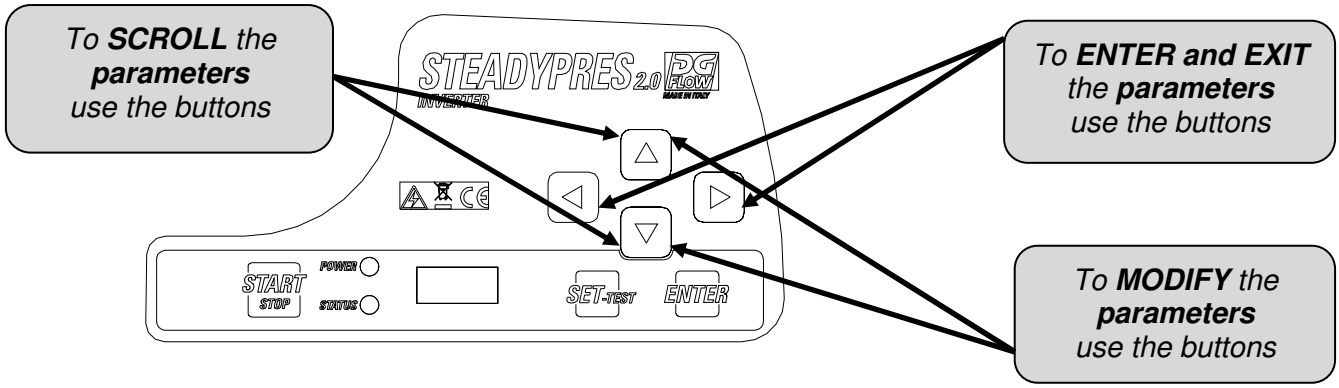
ACCESS TO MAIN MENU



MAIN MENU

BASIC	***BASIC MENU*** *parameters*	*BASIC PARAMETERS for the configuration of the drive.*
ADV	***ADVANCED MENU*** *parameters*	*ADVANCED PARAMETERS for the detailed configuration of the drive.*
INSP	***INSPECTION MENU*** *parameters*	*INSPECTION PARAMETERS, display the hours of work, the number of starts, alarm history, etc..*
TEST	***TEST mode*** ***(only in OFF mode)***	*TEST mode allows you to start and stop the pump in manual mode (START / STOP button) and change the frequency in steps of 1 Hz.* *It also allows to control the operating parameters of the motor and inverter.* ***WARNING: DURING MANUAL OPERATION, AUTOMATIC CONTROLS ARE EXCLUDED, AND THE OPERATOR MUST AVOID ANY INCORRECT OPERATION.***

ACCESS TO PARAMETERS



MENU STRUCTURE

SET

BASIC

P	SET PRESSURE
2P	SECOND SET PRESSURE
A	MOTOR CURRENT
RO	MOTOR DIRECTION OF ROTATION (models with three-phase output)

ADV

d	DIFFERENTIAL PRESSURE FOR RESTART
MF	NOMINAL MOTOR FREQUENCY
LF	MINIMUM OPERATION FREQUENCY
HF	MAXIMUM OPERATION FREQUENCY
Td	STOP DELAY FOR DRY RUNNING
PF	MINIMUM POWER FACTOR (only T/T models)
TPF	STOP DELAY FOR POWER FACTOR (only T/T models)
TP	RESTART INTERVAL FOR DRY RUNNING
TF	STOP DELAY FOR NO FLOW
RF	INVERTER REACTIVITY
FS	MODULE SWITCHING FREQ
US	NO GRIP STARTUPS
EI	INPUT SIGNAL
EO	OUTPUT SIGNAL
AI	RECYCLE FUNCTION
AT	RECYCLE ACTIVATION TIME
W	INVERTER ADDRESS
V	MAINS POWER SUPPLY VOLTAGE
Pd	iDRY PRESSURE (%)
FM	FLAT MODULATION
SET.F	RESTORE FACTORY SETTINGS

INSP

WH	OPERATING HOURS
TH	TOTAL OPERATING HOURS
NS	NO. START-UPS
SH	AVERAGE NO. START-UPS
E1	LAST FAULT
E1H	TIME OF LAST FAULT
……..	
E4	FOURTH LAST FAULT
E4H	TIME OF FOURTH LAST FAULT
EE	ERROR RESET

TEST

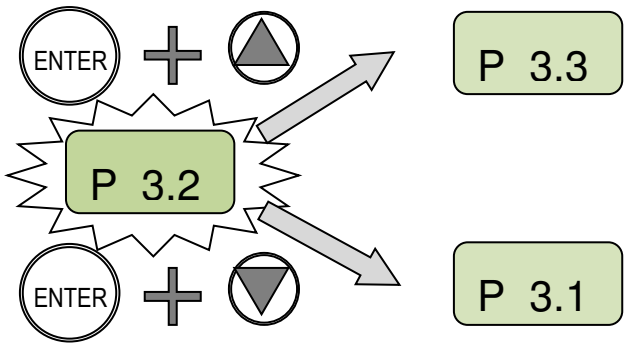
BASIC PARAMETERS

The basic parameters for the configuration of the inverter must necessarily be set during installation

	Param.		description	m.u.	Default	Min	Max	Step
BASIC	P 3.5	SET PRESSURE (bar)	**Sets the constant working pressure** in the system.	bar	3,5	1	10	0,1
				psi	50	15	130	1,5
	2P 2.5	SECOND SET PRESSURE (bar)	**Sets a second working pressure.** To activate configure parameter EI in ADV. parameters.	bar	2,5	1	10	0,1
				psi	35	15	130	1,5
	A 6.0	MOTOR CURRENT (A)	**Sets the motor rated current** at the inverter output (rated current of the motor) At **low supply voltages,** the current set should leave a margin (eg. + 15%) to compensate for the low voltage.					
				m.u.	Default	Min	Max	Step
			M/M 8.5	A	8.5	1	8,5	0,1
			M/M 11	A	11	1	11	0,1
			M/M 16	A	16	1	16	0,1
			M/T 7	A	7	1	7	0,1
			M/T 12	A	12	1	12	0,1
			T/T 6	A	6	1	6	0,1
			T/T 8	A	8	1	8	0,1
	RO →	MOTOR DIRECTION OF ROTATION	**ONLY FOR THREE-PHASE OUTPUT - Set the direction of rotation** of the three-phase motor (CW / CCW)					

Set pressure quick adjustment

To increase 0,1 bar press SIMULTANEOUSLY



To decrease 0,1 bar press SIMULTANEOUSLY

display the firmware version (FW)

To display the FW version of the CONTROL BOARD (FWI) and the POWER BOARD (FWP)

→ *Bring STEADYPRES out of service (OFF)*

→ *Press simultaneously*

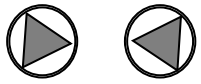
ADVANCED PARAMETERS

*Listed below the **ADVANCED PARAMETERS** for the configuration of the inverter*

	Param.	description	u.m.	Default	Min	Max	Step
ADV d 0.40	DIFFERENTIAL PRESSURE FOR RESTART	Sets the difference between the selected pressure (SETPOINT) and the effective restart pressure	bar	0,5	0,4	1,0	0,1
			psi	6	6	15	1,5
MF 50	NOMINAL MOTOR FREQUENCY	Sets the nominal frequency of the motor The set value MUST be the same as the value indicated on the motor plate	Hz	50	50	60	-
LF30	MINIMUM OPERATION FREQUENCY	Sets the minimum operating frequency	Hz	30	25	40	1
HF 50	MAXIMUM OPERATION FREQUENCY	Sets the maximum operation frequency. CAUTION!! Increasing the maximum frequency above the nominal frequency may cause significant motor overload.	Hz	MF	MF-5	MF +3	1
Td 10	STOP DELAY FOR DRY RUNNING	Sets the pump stop delay under dry running conditions CAUTION: high values of the stop delay may damage the pump	sec	10	1	100	1
PF .50	MINIMUM POWER FACTOR (only T/T models)	Sets the minimum value for the power factor below which the inverter stops the pump. By setting the minimum power factor value, read the value of the motor running with closed valves and deducting 0.03 to it;	-	0.50	0.50	0.99	0.01
TPF 0	STOP DELAY FOR POWER FACTOR (only T/T mod.)	Sets the time delay before the drive will perform the minimum power factor alarm. Setting the value to 0 (zero) disables this feature.	sec	0	0	3	1
TP10	RESTART INTERVAL FOR DRY RUNNING	Sets the interval between two successive automatic attempts to restart following stops for "dry running" Setting the value to “0” excludes attempts for automatic restarts	min	10	0	100	1
TF 3	STOP DELAY FOR NO FLOW	Sets the pump stop delay under no flow conditions	sec	3	1	15	1
RF 4	INVERTER REACTIVITY	Sets the inverter response speed to pressure changes The response value selected depends on the characteristics of the system	-	3	1	5	1

	Param.	description	u.m.	Default	Min	Max	Step
ADV FS 10	MODULE SWITCHING FREQ	Sets the switchover frequency for the power module. In case of long power cable, without a sinusoidal filter, set this value at the minimum	kHz	8	4	12	2
US 0	NO GRIP STARTUPS	Sets the interval between two consecutive automatic "no grip" start-ups (When the pump will be inoperative for a long). Setting the value to "0" disables the function.	min	0	0	999	1
EI 0	INPUT SIGNAL	Sets the digital input FUNCTION (clean contact type)	-	0	0/ 1/ 2/ 3/ 4/ 5		
		EI = 0: NO FUNCTION; the input state is ignored EI = 1: WATER LEVEL; Level signal input with NC logic EI = 2: EXT ENABLE; Start and disabling by external signal (NC) EI = 3: PRESS SET 2; enabling the second pressure level SETPOINT2 (NC). EI = 4: EXTERNAL LEVEL SIGNAL INPUT with NC logic; replaces the signal from the non-return valve. EI = 5: ALARM RESET SIGNAL INPUT					
EO 0	OUTPUT SIGNAL	Sets the digital output FUNCTION (clean contact type)	-	0	0/ 1/ 2/ 3		
Max 2 A @ 250 Vac Max 1 A @ 30 Vdc		EO = 0: NO FUNCTION; the state of the output is never activated. EO= 1: ALARM OUTPUT; condition of stop due to fault. EO = 2: PUMP OPERATING OUTPUT; there is at least one operating pump. EO = 3: recirculation; activates the relay output time intervals defined by param. AI					
AI 60	RECYCLE FUNCTION	Sets the output activation interval (clean contact type) configured as recycle function (Eo=3)	min	60	1	999	1
AT 10	RECYCLE TIME	Sets the duration of the activation of the output signal (clean contact type)	sec	10	1	999	1
W NC	INVERTER ADDRESS	Activates communication between two or more inverters, defining the function of each unit: MS (MASTER unit) , S1/S2 (SLAVE unit), NC (operation with a single inverter)	-	NC	NC/ MS/ S1/ S2		
V 230	MAINS POWER SUPPLY VOLTAGE	Sets the mains power supply voltage. 230 V for single phase power supply versions 400V for three phase power supply versions	V				
Pd 70	iDRY PRESSURE (%)	Sets the minimum pressure value (expressed as % of the SET pressure) that must be reached in no flow, otherwise an alarm of dry running	%	70	10	100	1
FM	FLAT MODULATION	Enable / disable the FLAT modulation; FLAT modulation reduces the heating of the power components of the inverter	-	1	0	1	1
SET.F	RESTORE FACTORY SETTINGS	Base and Advanced menu will be factory restored. CAUTION: DO NOT USE THIS FUNCTION in the pumping unit UPV-OS as these models have a special setting. To reset the factory parameters, press the ENTER key and hold until "OK" appears on the display (ENTER → **** → OK)					

DISPLAY THE OPERATING PARAMETERS

During operation	*To display the parameters on the display*	*Scroll the parameters through the keys*	
Pressing the key			*You go back to the system pressure (only for MASTER inverter)*

Display	Description	m.u..
P 3.2	***SYSTEM PRESSURE*** *Displays the system pressure (only for MASTER inverter)*	**bar**
F 45	***OPERATING FREQUENCY*** *Displays the motor revolution Frequency.*	**Hz**
A 6.5	***ABSORBED CURRENT*** *Displays the motor absorbed current (RMS value)* *CAUTION! Standard ammeter may read input and output current values different from the one shown by inverter.*	**A**
V 230	***DYNAMIC VOLTAGE*** *It matches to the power supply 'voltage value' - only with pump in standby.*	**V**
PF .85	***Power factor (COSFI):*** *Shows the instantaneous value of the power factor* **(only T/T models)**	
Tm 50	***POWER MODULE TEMPERATURE*** *Displays the inverter's electronic module temperature.*	**°C**
Ti 30	***INVERTER BOX INTERNAL TEMP.*** *Displays the box internal Temperature* **(only T/T models)**	**°C**
Tc 50	***INVERTER BOX INTERNAL TEMP.*** *Displays the box internal Temperature* **(only T/T models)**	**°C**
In 0	***INPUT ACTIVATION STATUS*** *Displays the input signal activation Status* *1= enabled input / 0= input not enabled*	
Ou 0	***OUTPUT ACTIVATION STATUS*** *Displays the output relay activation Status* *1= enabled input / 0= input not enabled*	
S1-S2	***STATUS RS 485 (SLAVE connection)*** *Displays the status of the inverter SLAVE connected to the inverter MASTER.* *The parameter is not displayed in applications STAND-ALONE (parameter W = NC).* *XX-XX = no SLAVE inverter connected* *S1-XX = inverter SLAVE1 connected* *XX-S2 = inverter SLAVE2 connected* *S1-S2 = inverter SLAVE1 e SLAVE2 connected*	

TEST

to start and adjust the pump manually → *Enter the TEST mode see* ***ACCESS TO MAIN MENU*** → *Proceed as shown below to start and adjust the pump speed* → *During the test, you can* ***view all the operating parameters*** *(see* ***DISPLAY OF OPERATING PARAMETERS)***

CAUTION: TEST mode is not active on the SLAVE unit; *to make a TEST on the SLAVE unit, switch off temporarily the MASTER unit, so that the SLAVE unit becomes independent and is able to perform the TEST normally*

Key	instruction	display
	in TEST mode the word "TEST" is displayed	TEST
START	*start the pump by pressing the START / STOP button, the pump starts at the minimum frequency*	P 2.0
	Display the operating frequency by scrolling with the RIGHT arrow	F 30
	set the operation frequency by pressing the keys (step 1 Hz)	F 35
	display the operating parameters by pressing the keys	A 3.5
STOP	*To stop the TEST, press the A* ***START*** */* ***STOP*** *button*	OFF

PRIMING AND STARTING UP

- ***Do not run pumps dry***
- *Before starting the pump, make the* ***filling of all pumps***
- ***In the pressure units****, the filling is for single pump by turning off all other pumps*
- *When the pump is completely filled with water, bring in TEST mode (manual operation) and* ***prime the pump*** *by opening the discharge valve gradually*
- *When the pump is primed, stop the manual mode by pressing STOP and* ***switch to automatic mode*** *by pressing START.*

CONNECTION OF INVERTER MASTER AND SLAVE

- *set the parameter W (see page 34) of the inverter 1 to MS (will be MASTER)*
- *set the parameter W (see page 34) of the inverter 2 to S1 (will be SLAVE 1)*
- *Connect MASTER and SLAVE as shown at page 29*
- *after the connection only the MASTER takes any set and drives the SLAVE*
- *the SLAVE only can be put out of service through START/STOP button*

ALARMS

OVER CURRENT %	*The current **exceeded the allowable tolerance** on the current set.* *The inverter stops the pump, the rearm is only manual.*
CURRENT LIMIT	*The current **exceeded the module current capacity.*** *The inverter stops the pump, the rearm is only manual.*
i DRY	*Occurs if, in the absence of flow, **the pump cannot reach the SET pressure**, but **can reach at least a pre-determined percentage** of the SET pressure, defined through the parameter Pd. The inverter does not stop the pump, which continues to work with the message "i-DRY" on the display.*
DRY RUNNING	*Occurs if, in the absence of flow, **the pump fails to reach the pressure** of the set but **does not even reach a predetermined percentage of the SET pressure**, expressed by the parameter Pd; the inverter stops the pump.* *The error is reset after the time TP and the inverter re-starts in automatic mode.*
LOW PRESS	*Occurs if the pump is running at maximum frequency (50/60 Hz), in the presence of flow, and **the pressure doesn't reach 0.3 bar**; the inverter stops the pump.* *The error is reset after the time TP and the inverter re-starts in automatic mode.*
LOW VOLTAGE	*a **voltage drop** has occurred beyond minimum operating threshold. The inverter stops the pump. The error is reset after one minute, and the inverter re-starts in automatic mode.*
HIGH VOLTAGE	*a **voltage peak** has occurred beyond maximum operating threshold. The inverter stops the pump. The error is reset after one minute, and the inverter re-starts in automatic mode.*
HIGH TEMP. BOX *(only T/T mod.)*	*The **temperature inside the inverter** has reached 65 °C; is automatically **limited the maximum** frequency of 5 Hz but **the drive continues to run**, the error is reset below 60 °C*
OVER TEMP. BOX *(only T/T mod.)*	*The **temperature inside the inverter** has reached 80 °C, **the inverter stops the pump,** the error is reset below 60 °C and the drive will restart automatically*
HIGH TEMPERATURE MOD	*The **module temperature** has reached the first alarm threshold; **the maximum working frequency** is automatically limited, but **the drive continues to run**, the error is reset when the module temperature returns below 70 °C*
OVER TEMP MOD	*The **module temperature** has reached the second alarm threshold, **the inverter stops the pump,** the error is reset when the module temperature returns below 70 °C and the drive will restart automatically*
INPUT ERROR	*There has been a **reversal of the power connections** / output to the motor. the inverter is locked, the error is reset by connecting the cables correctly in the terminal*
COM ERROR	***communication has been interrupted** between the control board and the power board; the causes could be the integrity of the cable and of the connection ports or an electronic board fault.*
PHASE ERROR	*(only for models with three-phase output) **lack of a phase towards the motor** during operation. The inverter stops the pump ; reset is manual only.*
LOW LEVEL	*this occurs when the digital input EI is **configured as "WATER LEVEL" (level signal) and there is no signal.** When the signal returns, the message disappears and the inverter operates normally again.*
EXT OFF	*this occurs when the digital input EI is **configured as "EXT ENABLE" (control enabled from outside) and there is no signal**. When the signal returns (external enabling) the message disappears and the inverter operates normally again.*
➔ OFF	*It occurs when the supply voltage is disconnected; the capacitors are discharged, for security reasons, from the discharge resistors. The process takes about 10 sec*

PART 2
OPERATOR'S AND MAINTENANCE MANUAL

GENERAL REMARKS

STEADYPRES ***is a speed controller*** *with the following features:*

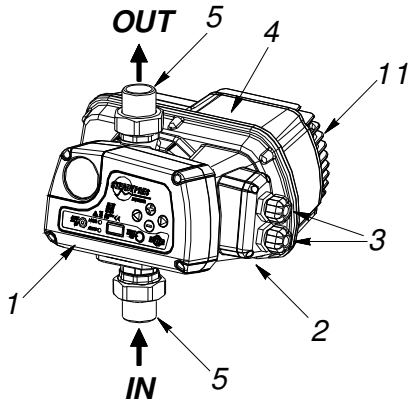
- *Powered by AC single-phase or three-phase*
- *Output AC single-phase or three-phase*
- *It maintains the system at* ***constant pressure*** *(VARIABLE SPEED CURVES)*
- *It carries out* ***continuous controls*** *on electric and functioning parameters, saving the pumping unit from all common failures (over-currents, dry running, etc)*
- *It works in* ***stand-alone configuration or in parallel*** *with other units, through serial connection.*
- *applications in parallel, with a MASTER inverter and SLAVE inverters, controlled by the MASTER.*
- *The MASTER receives the programming of the parameters and controls the operating data, and activates and deactivates the SLAVE as needed.*
  If the MASTER is turned off, the SLAVE becomes independent and will continue to operate independently.
- ***Adapts to any type of system*** *pressurization, even existing*
- *Limits the peak currents during starts and operation,* ***energy-saving****.*
- *Allows the selection of the power supply and output voltage.*

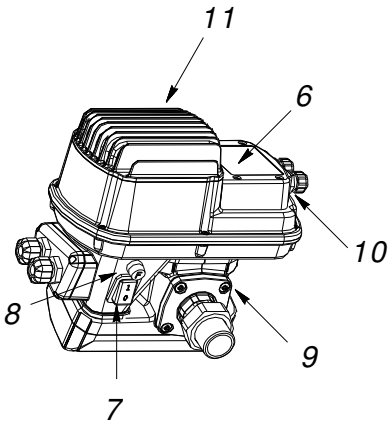
PART LIST

1- control system
2- removable electric connector
3- I/O power cable bushing
4- power board cover
5- three-piece joint
6- tecnica data plate
7- master switch (not present in T/T models)
8- fuse (not present in T/T models)
9- non-return valve unit
10- expansion board cover
11- capacitors box

NOTE: master switch and fuse are only available in versions with single-phase power supply, while the models with three-phase power supply (T/T models) are without.

For the T/T models the inverter supply line must be protected by suitable devices in conformity with applicable standards.



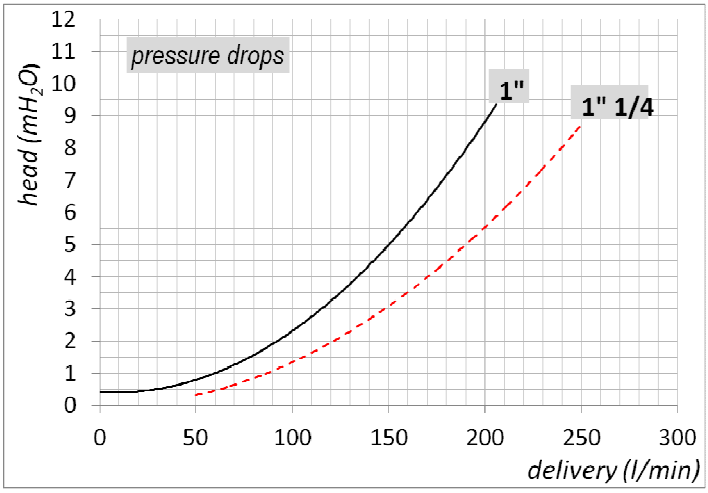


- *In* ***applications in parallel,*** *there is a MASTER inverter that controls one or two* ***SLAVE inverter.***
  The MASTER receives the programming of the parameters *and controls the operating data, and activates and deactivates the SLAVE as needed.*
  If the MASTER is turned off, the SLAVE goes back to being self-employed and will continue to operate independently

  When working in parallel with other inverters, STEADYPRES controls the ***alternation of starting*** *to make the use of the pumps uniform.*

WORKING LIMITS

- ***maximum working pressure**: 10 bar (140 p.s.i)*
- ***fluids accepted:** clean water and liquids that are chemically non-aggressive. If there are impurities in the liquid, install a strainer upstream*
- ***fire / explosion:** inverters STEADYPRES **ARE NOT SUITABLE** for operation in environments with risk of explosion.*
- ***Maximum ambient temperature:** 40 °c; D*
- ***minimum ambient temperature**: 0 °C*
- ***max liquid temperature**: 55 °C*
- ***min liquid temperature**:: 0 °C*
- ***supply voltage tolerance**: + / - 10% compared to the nameplate data*
- ***flow rates and pressure drops**: in side figure is represented the loss of load (in mH2O) through the inverter, to vary the flow rate*



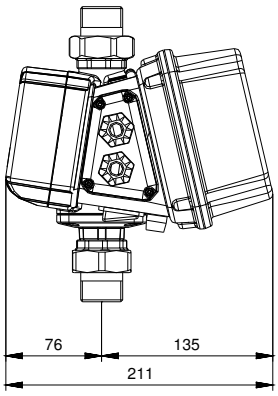
TECHNICAL DATA

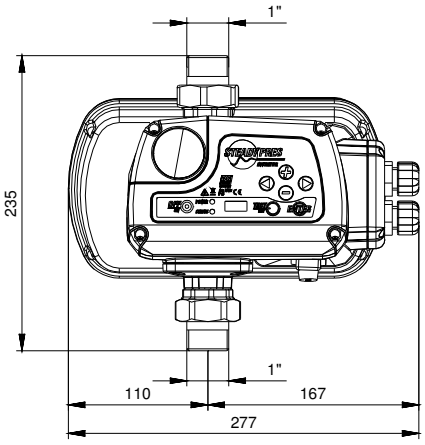
main voltage supply	*230 **+/- 10%** Vac single-phase*	*(models M/M e M/T)*	*WARNING: IN CASE OF LOW VOLTAGE (NOMINAL VALUE -10%) OVERCURRENTS CAN OCCUR DURING STARTING OR FULL LOAD OPERATION.*
	*400 **+/- 10%** Vac three-phase*	*(models T/T)*	
output voltage	*230 Vac single-phase*	*(models M/M)*	
	230 Vac three-phase	*(models M/T)*	
	400 Vac three-phase	*(models T/T)*	
frequency	*50 – 60 Hz*		
enclosure	*IP 65*		
working position	*vertical, with the liquid inlet from the bottom and top exit.*		

Current and power table

Model	*V in*	*V out*	*A out*	*Fuse (A)*	*P2 max (kW)*	***P2 max (HP)***
M/M 8.5	*1 ~ 230V*	*1 ~ 230V*	*8,5*	*20*	*1,1*	***1,5***
M/M 11	*1 ~ 230V*	*1 ~ 230V*	*11*	*25*	*1.5*	***2.0***
M/M 16	*1 ~ 230V*	*1 ~ 230V*	*16*	*25*	*2,2*	***3,0***
M/T 7	*1 ~ 230V*	*3 ~ 230V*	*7*	*20*	*1,1*	***1,5***
M/T 12	*1 ~ 230V*	*3 ~ 230V*	*12*	*25*	*2,2*	***3,0***
T/T 6	*3 ~ 400V*	*3 ~ 400V*	*6*	*no*	*2,2*	***3,0***
T/T 8	*3 ~ 400V*	*3 ~ 400V*	*8*	*no*	*3,0*	***4,0***

DIMENSIONS AND WEIGHTS





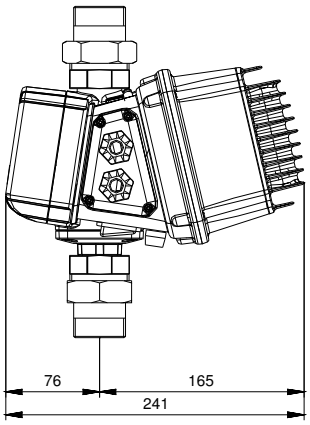
Mod.

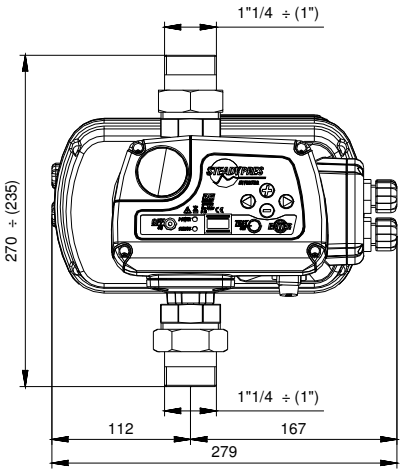
M/M 8.5

M/M 11

M/T 7

M/T 12





Mod.

M/M 16

T/T 6

T/T 8

Model	*connection*	*weight (kg)*	*Packaging dimensions (A x B x H - mm)*
M/M 8.5 - M/M 11 – M/T 7 – M/T 12	***1"***	*2,9*	*260 x 200 x H 260*
M/M 16 – T/T 6	***1"***	*3,7*	*260 x 200 x H 260*
T/T 8	***1" ¼***	*4,1*	*260 x 200 x H 260*

PRODUCT IDENTIFICATION CODE

ST M / T 10 P

PRODUCT FAMILY
INVERTER SUPPLY: M = single-phase, T = three-phase
MOTOR OUTPUT: M = single-phase, T = three-phase
MODEL
Configuration: E = expandable, P = parallelable

SURGE TANK

- *accumulates water under pressure to minimize the start-up of the pumps*
- *it is essential in the presence of small system leakages*
- *absorbs overpressures from the system*
- *the minimum tank volume, in liters (for diaphragm models) is approx. equal to 10% of the maximum capacity of the single pump, expressed in l/min; example in a standard application:*
  Qmax = 80 l/min → V = 80 x 10% = 8 liters
  rounded up to commercial size
- ***pre-charge: a. 70% of the working pressure: e.g.:***
  Pset = 4 bar → Ppre-charge = 2,8 bar

INSTALLATION

Before installing and using STEADYPRES:

- *read this manual thoroughly and carefully and refer to the Safety Standards.*
- *Before making the connections, make sure that the ends of the line wires are not live.*
- *Make sure also that the electric power supply network is protected by thermal magnet and differential protections according to the applicable Standard in force. The **differential switch must be high-sensitivity type** (30 mA in class A for domestic application, class B for industrial applications)*
- ***Ground connections** must be in compliance with Standards.*
- *Check that the plate data is that required and suitable for the system*
- *The **cable section** (**power supply cable** and **connection cable between the inverter and the motor)** must be dimensioned according to:*
  - *Voltage (230 V single-phase, 230 V three-phase, 400 V three-phase)*
  - *Pump power*
  - *Cable lenght*
- *The power supply cable and the motor cable must be sized to curb any **power voltage drop within 3%.***
- *The power supply cable and the motor cable must be suitably **shielded** to comply with EMC standards.*
- *In case of **long cables** between Inverter and pump motor, evaluate the application of inverter output sinusoidal filter. It aids smooth running of motors eliminating negative effect of voltage peaks*

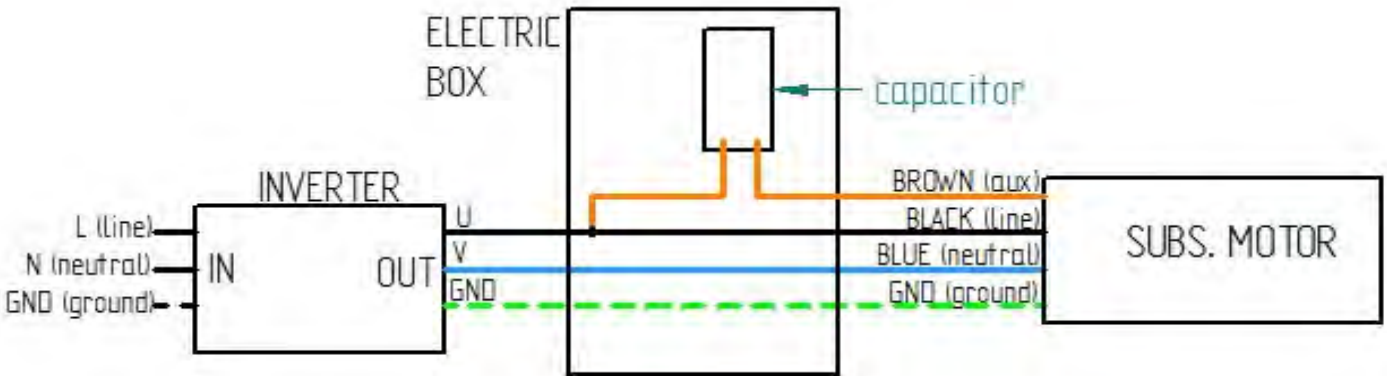
For CONNECTIONS see QUICK INSTALLATION GUIDE

SELF-LIMITING OVERLOAD

*If the **current** detected by the inverter* → *Or the **temperature** of the inverter* → ***Exceed** the safety limits* → *STEADYPRES proceeds to a progressive **reduction** in the frequency of operation* → *As long as the values are returned within the limits*

While operating in self-limitation, DISPLAY and LED flash to indicate the fault status

CONNECTION OF 4-CABLE SUBMERSIBLE SINGLE-PHASE MOTOR



STARTING UP

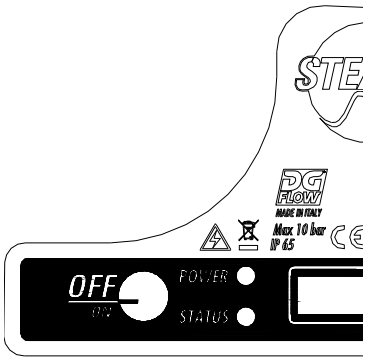
- *Before running, this Manual must have been carefully read and the instructions followed; wrong settings and operations are thus prevented that could cause operating faults*
- *Before starting the system, the pumps must be primed (filling and air bleeding)*

- *After performing the operations described in the INSTALLATION chapter, the inverter can be started.*
- *When STEADYPRES is switched on, it enters the STARTING phase, which lasts 10 seconds, after which **STEADYPRES returns to the same operating conditions in which it was when it was last switched off**:*
    - *in WORK mode if at the time of the last shutdown was IN SERVICE*
    - *in OUT OF SERVICE mode if at the time of the last shutdown was OUT OF SERVICE (OFF)*
- *In case of accidental fall of the power line, if it STEADYPRES was in serivce, when the power returns, it automatically returns in service*
- *To put STEADYPRES **IN SERVICE / OUT OF SERVICE,** beat the START / STOP button.*
- *In applications with parallel inverters (MASTER / SLAVE) is just the MASTER inverter that receives input from the keyboard*
- *SLAVE inverters operate independently only if the MASTER is turned off, in which case they receive input from its own keyboard.*
- *In each group can be only one MASTER, one SLAVE 1 and one SLAVE 2.*
- *In normal operation, you can view the status parameters.*

  *For visualization of the operating parameters see **QUICK INSTALLATION GUIDE***

LIGHT SIGNALS

keyboard



● ON	○ OFF	◌ BLINKING	
○ POWER STATUS			*STEADYPRES does not detect power supply.* ***WARNING: cannot guarantee the absence of power supply, the electronic board may be faulty, but under tension***
● POWER ○ STATUS			*STEADYPRES is live, but the pump is not running (STAND-BY)*
● POWER ● STATUS			*STEADYPRES is live, and the pump is running*
● POWER ○ STATUS			*STEADYPRES is live, but out of serivce; the re-arm is only manual*
● POWER ● STATUS			*STEADYPRES is in ALARM mode, re-arm is only manual*

INSPECTION MENU

the menu INSP (inspection) allows you to view the history of the inverter: the operating hours, number of starts, alarm recording.

INSP

WH	***OPERATING HOURS***	*Operating hours with the pump running*
TH	***TOTAL OPERATING HOURS***	*Total No. Hours working*
NS	***NO. START-UPS***	*total Number of start-ups*
SH	***AVERAGE NO. START-UPS***	*Average number of start-ups per working hour.*
E1	***LAST FAULT***	*last fault that occurred in chronological order*
EH	***TIME OF LAST FAULT***	*time at which the fault occurred (referred to TH)*
EE	***ERROR RESET***	*to reset the error log press the ENTER key and hold, until "OK" is confirmed on the display (ENTER → **** → OK)*

TROUBLESHOOTING

- ***Check that the inverter has been correctly connected to the power line (which is on)***
- ***Check that the motor pumps have been correctly connected to the inverter***
- ***Check that all the cables and connections are operative.***

PROBLEM	***The pump is not feeded***	
Message	*Cause*	*intervention*
none	*Interruption of power supply*	*Replace the power supply*
none	*Burned fuses*	*Substitute the fuses*
none	*Intervention of the line protections*	*Check the correct protecttions setting*
INPUT ERROR	*(only mod. T/T) - connections LINE and MOTOR were reversed*	*Check the connections LINE and MOTOR and connect correctly*
PROBLEM	***The current circuit breaker has tripped to protect the DGBOX power line***	
Message	*Cause*	*intervention*
none	*The residual current circuit breaker is inadequate for inverter supply*	*Replace the residual current circuit breaker with a model suitable for the pulsating components and in direct current (class A)*
PROBLEM	***The pump fails to start***	
Message	*Cause*	*intervention*
OFF	*The pump is out of service (placed manually out of service)*	*Put the pump back into service by pushing START*
PROBLEM	***The pump stopped and fails to re-start***	
Message	*Cause*	*intervention*
OVER CURRENT	*overcurrent absorption compared to set value (parameter A in BASE PARAMETER)*	*- check the correct current setting* *- check the power voltage under load at pump terminals (min -15%)* *- make sure the motor pump is turning freely and is not braked* *- check the correct direction of rotation* *- check the correct sizing of the wires*
CURRENT LIMIT	*Serious overcurrent absorption which inverter cannot cope with*	*Make sure the motor pump is not blocked, reduce the motor acceleration by means of the ACCELERATION parameter.*
DRY RUNNING (DRY RUNNING PF)	*- Lack of water at suction* *- pump not primed* *- suction blocked* *- wrong direction of motor rotation*	*- Check correct suction conditions* *- prime the pump* *- check the suction piping* *- check the correct direction of motor rotation*
LOW PRESS	*The system does not reach the minimum pressure*	*Check that there are no broken pipes.*
LOW VOLTAGE	*Deviation of the supply voltage higher than –15% of the plate voltage*	*Check the supply voltage and the section and length of the inverter power cables*
HIGH VOLTAGE	*Deviation of the supply voltage higher than +15% of the plate voltage*	*Check the supply voltage*
OVER TEMP BOX (solo T/T)	*internal overheating due to overload or excessive ambient temperature*	*Make sure the air cooling channels are free and that the fans are working, check the pump load*
OVER TEMP MODULE	*Module overheating due to overload*	*check the pump load*
COM ERROR	*No communication between control board and power board*	*Check the integrity of the connection cable and connections; the power board could be damaged*
LOW LEVEL	*No level signal with level signal input on*	*Make sure there is water at suction or check level signal operation*
EXT OFF	*Placing out of service by means of external signal*	*Check the external signal*
none	*Pressure sensor fault*	*Check the display pressure with a reference manometer, re-calibrate or substitute the pressure sensor*

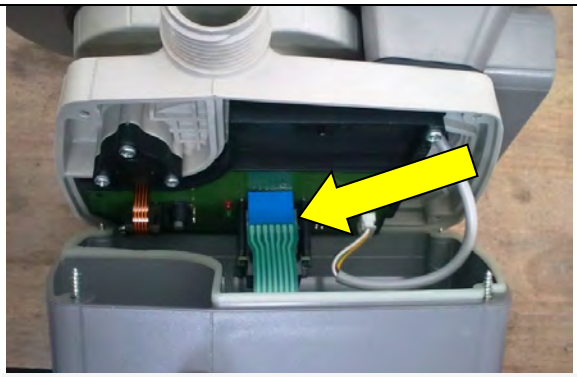
PROBLEM	Pump always running even when not required	
Message	Cause	intervention
None	System leaks greater then 2 l/min	Identify the leaks and repair
None	Flow sensor fault or locked open	Inspect and check the flow sensor
PROBLEM	**The pump stops too soon when requested**	
Message	Cause	intervention
none	Flow rate sensor fault	Check the flow rate sensor
Message	Cause	
Message	Cause	intervention
none	Air inside suction manifold	Bleed the suction system
none	Pump blocked or damaged	Inspect the pump and eliminate the problem

MAINTENANCE

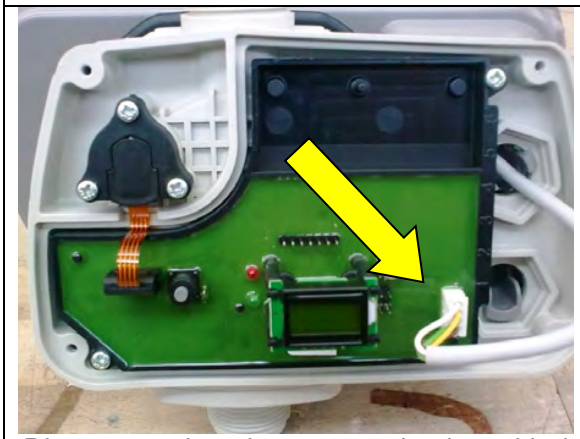
Replacement of the CONTROL BOARD + PRESSURE SENSOR

- Disconnect the inverter main power supply and wait 2 minutes (capacitors discharge)
- Open the front cover and disassembly the pressure sensor and the control board as shown below
- Install the new control board with pressure sensor in reverse order of removal.

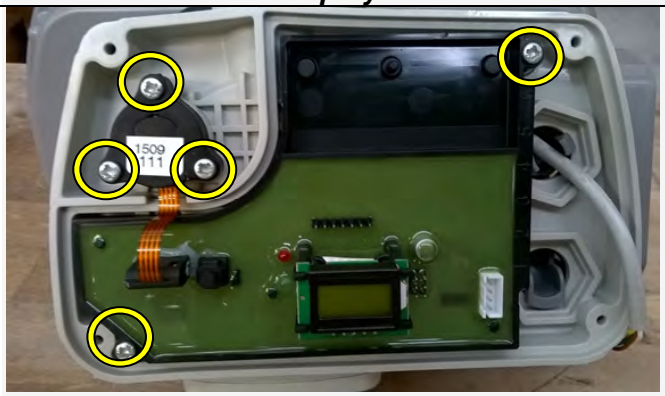
Open the front cover by unscrewing the 4 screws



Before removing the cover, disconnect the ribbon cable of the display



Disconnect the wire communication with the power board



Remove FIRST the PRESSURE SENSOR and THEN the CONTROL BOARD by unscrewing the 5 screws indicated

Re-assemble the new BOARD+SENSOR in the same way but in reverse order:

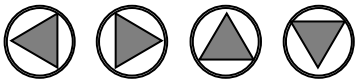
- **FIRST assemble the CONTROL BOARD**
- **THEN assemble the PRESSURE SENSOR**
- **connect the wire communication with the power board**
- **connect the ribbon cable of the display and close the front cover**

ATTENTION:

1. ***MAKE THE FACTORY PARAMETERS RESET BEFORE STARTING THE INVERTER (parameter SET.F at page 11 of the Manual)***
2. ***RESTORE MANUALLY THE SPECIFIC PARAMETERS OF THE SYSTEM***
3. ***DO NOT RE-CALIBRATE THE PRESSURE SENSOR, IT IS FACTORY-CALIBRATED***

CALIBRATION OF THE PRESSURE SENSOR

- *You need an **auxiliary gauge** near STEADYPRES*
- ***bring the system (and STEADYPRES) pressure to zero (0 bar)***
- ***Start the calibration** of the pressure sensor according to the diagram below.*

display	*action*
P x.x	*Switch the inverter off*
display off	*Switch the inverter on*
STARTING (for 10 sec.)	*Press simultaneously the 4 buttons, within the 10 seconds of STARTING.* 
ZERO	***Check** on the gauge that the pressure of the system is ZERO*
	***Press the button SET/TEST** to confirm the zero pressure*
SP 5.0	***Start the pump by pressing START button;** the pump starts at the minimum frequency*
SP 5.0	*Increase the frequency of the pump by pressing the button*  *until you reach the required pressure of 5 bar* ***If the pump is not able to reach 5,0 bar**, reduce the required pressure by pressing the button*  *(e.g. to 4 bar)*
SP 4.0	***Check** on the gauge that the pressure of the system is that required by the inverter (e.g. 4 bar)*
	***Press the button ENTER** to confirm*
F hi	***Press again the button ENTER***
P_3.5	*The inverter re-starts in automatic mode, **the sensors calibrated.***

FITTING THE EXPANSION BOARD

- Switch off power to the inverter and wait 2 minutes for the capacitors discharge

- Open the back cover as shown in the figure on next page

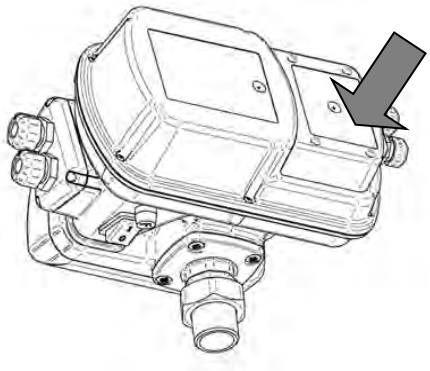
- Insert the flat cable of the expansion board (see picture on next page) on the mating connector mounted on the power board of the inverter

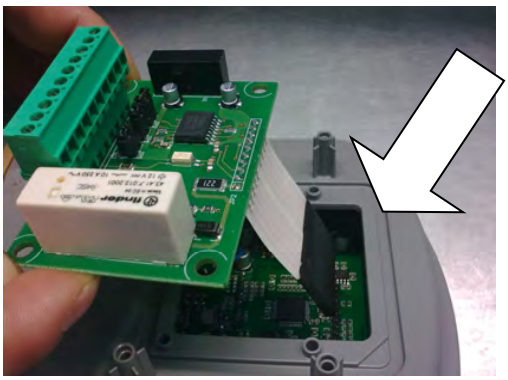
- WARNING: PAY ATTENTION TO PROPERLY FIT THE CONNECTOR

- Block the expansion board with 4 screws

- Connect signals (see SIGNALS CONNECTION.)

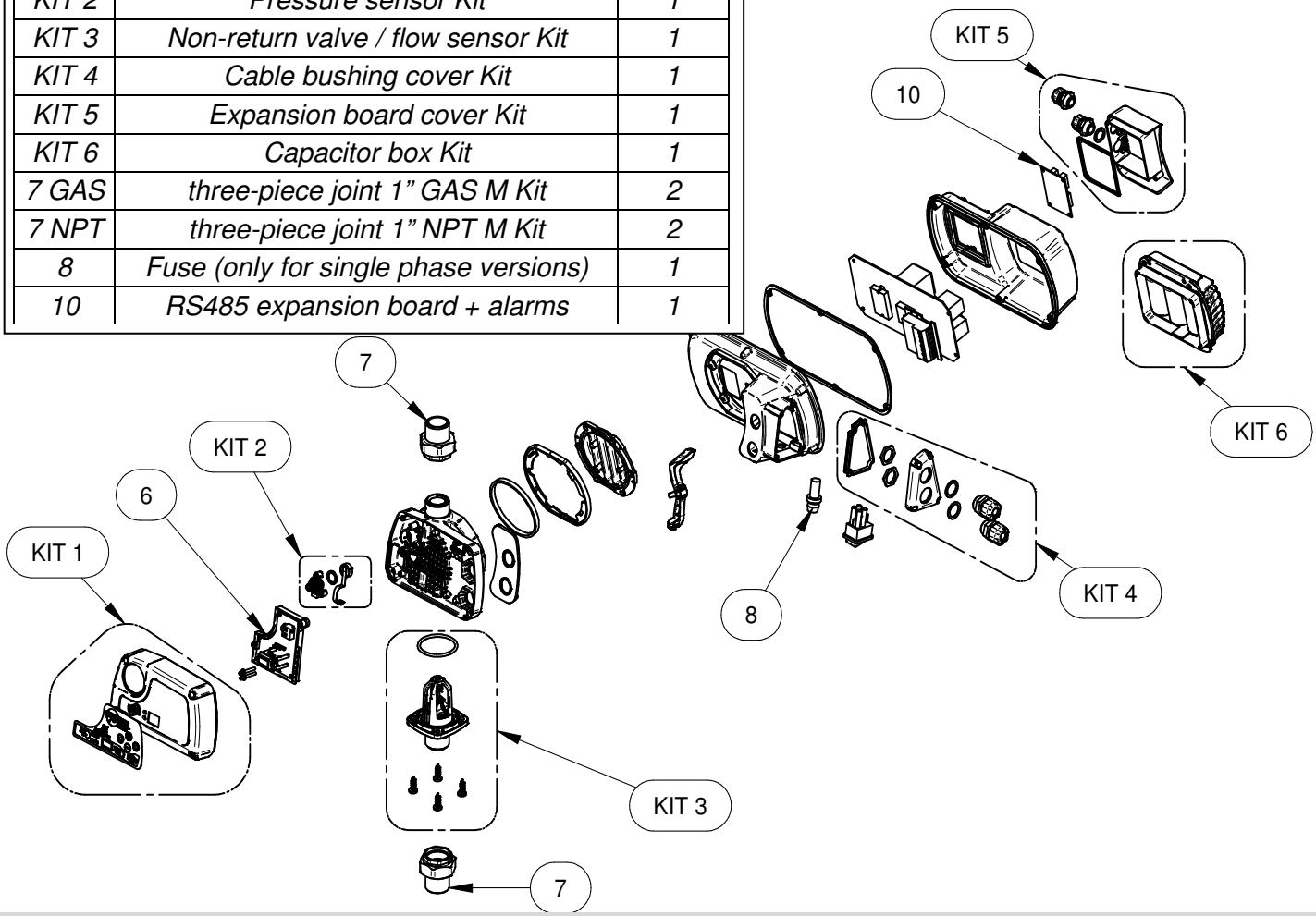
- Close the back cover





SPARE PARTS DIAGRAM

N°	*Description*	*Q.ty*
KIT 1	*Cover Kit with keyboard*	*1*
KIT 2	*Pressure sensor Kit*	*1*
KIT 3	*Non-return valve / flow sensor Kit*	*1*
KIT 4	*Cable bushing cover Kit*	*1*
KIT 5	*Expansion board cover Kit*	*1*
KIT 6	*Capacitor box Kit*	*1*
7 GAS	*three-piece joint 1" GAS M Kit*	*2*
7 NPT	*three-piece joint 1" NPT M Kit*	*2*
8	*Fuse (only for single phase versions)*	*1*
10	*RS485 expansion board + alarms*	*1*



WARRANTY

Before installation and use of the product, read this manual completely and thoroughly. Installation and maintenance must be carried out by qualified staff, responsible for performing the hydraulic and electric connections according to the applicable Standards in force.
The manufacturer declines all responsibility for damage deriving from improper use of the product and is not liable for damage caused by maintenance or repairs that are carried out by unqualified staff and/or using non-original spare parts. The use of non-original spare parts, tampering or improper use making the warranty null and void.

DISPOSAL

For the disposal of DGBOX components, follow the Standards and Laws in force in the countries where the unit is used.
Do not disperse pollutant parts in the environment

DECLARATION OF CONFORMITY

CE

We declare, under our own responsibility, that the product in question is in compliance with the following European Directives and national implementation provisions.

2014/35/EU Low Voltage Directive

2011/65/EU Dangerous substances in electronic appliances (RoHS)

2012/19/EU and 2003/108/ CEE Dangerous substances in electronic appliances (WEEE)

2014/30/EU Electromagnetic Compatibility Directive (EMC):

Models with single-phase power (M/M 8.5, M/M 11, M/M 16, M/T 7, M/T 12):
EN 55014-1 (emission)
EN 61000-3-2 (emission)
EN 61000-3-3 (emission)
EN 55014-2 (immunity)
EN 61000-4 (immunity)

Models with three-phase power (T/T 6, T/T 8):
EN 61800-3
EN 55011 (emission)
EN 61000-3-2 (emission)
EN 61000-3-3 (emission)
EN 55014-2 (immunity)
EN 61000-4 (immunity)

Bigarello, 20/02/2015

DGFLOW S.r.l.
President
Stefano Concini