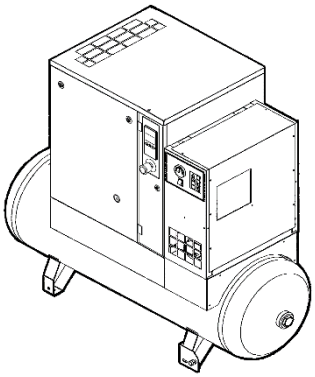
Code	
9828093685	**01**
Edition 11/2023	

INSTRUCTION AND MAINTENANCE MANUAL

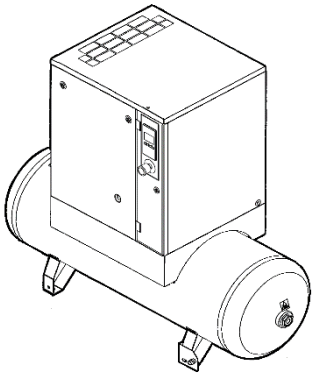
SILENCED SCREW ROTARY COMPRESSOR UNITS

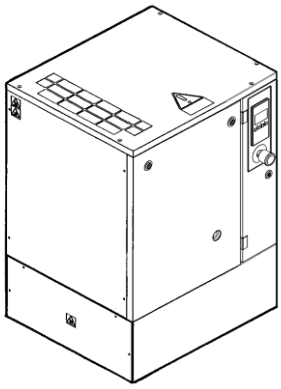
HP 3 - 4 - 5,5 - 7,5 - 10 (IVR*)
KW 2,2 - 3 - 4 - 5,5 - 7,5 (IVR*)

(IVR*): Variable speed compressors (INVERTER)



THIS MACHINE MUST BE CONNECTED TO TWO DIFFERENT POWER SUPPLIES: THREE-PHASE SUPPLY FOR THE COMPRESSOR AND SINGLE-PHASE SUPPLY FOR THE DRYER





READ THIS MANUAL CAREFULLY BEFORE CARRYING OUT ANY OPERATIONS ON THE COMPRESSOR UNIT.

THIS MACHINE IS DESIGNED FOR BOTH CONTINUOUS AND INTERMITTENT WORKING, HOWEVER TO AVOID CONDENSATION PROBLEMS IN THE OIL, THE MACHINE MUST OPERATE CONTINUOUSLY IN LOAD FOR AT LEAST 10% OF THE TIME, CHECK FOR SIGNS OF CONDENSATION IN THE OIL BY FOLLOWING THE INSTRUCTIONS GIVEN IN CHAPTER 15.2

ATTENTION: THE CAPACITORS INSIDE THE INVERTER MAY REMAIN LIVE FOR 15 MINUTES AFTER THE MACHINE HAS BEEN DISCONNECTED FROM THE MAINS POWER.
ACTING ON THE INVERTER BEFORE 15 MINUTES HAVE PASSED MAY ENTAIL THE RISK OF ELECTROCUTION AND DEATH.

CONTENTS

IMPORTANT: A COPY OF THE WIRING DIAGRAMS CAN BE FOUND INSIDE THE ELECTRIC BOARD OF THE COMPRESSOR.

ADDRESSES OF ASSISTANCE CENTRES

In the event of breakdown or malfunction of the machine, switch it off and do not tamper with it.
We remind you that our technical service department is at your complete disposal to help you resolve any problems that may possibly be encountered, or to provide you with any other information necessary.
The constant and efficient performance of the compressor is ensured only if original spare parts are used.
We recommend therefore that you strictly observe the indications provided in the MAINTENANCE section and to use EXCLUSIVELY original spare parts.
The use of NON ORIGINAL spare parts automatically annuls the guarantee.
Failure to comply with the above may endanger the safety of the machine.

INTRODUCTION

Keep this manual with care for future consultation; the use and maintenance manual is an integral part of the machine. Read this manual carefully before carrying out any operations on the compressor unit.
The installation of the compressor unit and all operations involving it must be performed in conformity with the regulations in force concerning electric plants and personal safety.

CHARACTERISTICS AND SAFETY PRECAUTIONS

MACHINE WITH AUTOMATIC START

LOCK OUT – TAG OUT (LOTO): OPEN THE POWER-ISOLATING SWITCH AND LOCK IT WITH A PERSONAL LOCK. TAG THE POWER-ISOLATING SWITCH WITH THE NAME OF THE SERVICE TECHNICIAN.

BEFORE REMOVING THE PROTECTIVE GUARDS TO CARRY OUT ANY MAINTENANCE ON THE MACHINE, SWITCH OFF THE ELECTRIC POWER SUPPLY AND DISCHARGE THE RESIDUAL PRESSURE INSIDE THE UNIT.

ALL WORK ON THE ELECTRIC PLANT, HOWEVER SLIGHT, MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL.

THIS MACHINE IS NOT SUITABLE FOR EXTERNAL INSTALLATION

THIS MACHINE CORRESPOND TO THE ESSENTIAL SAFETY REQUIREMENTS FORESEEN FROM THE EUROPEAN STANDARD (2006/42 CE).

THE LUBRICATING LIQUIDS AND OTHER EVENTUAL FLUIDS MUST NOT BE DISCHARGED IN THE ENVIRONMENT. THESE POLLUTING AND HAZARDOUS PRODUCTS MUST COMPULSORY BE DISPOSED BY CHARGING AUTHORISED AND SPECIALISED FIRMS ACCORDING TO THE DIFFERENT TYPOLOGY OF PRODUCT.

DIFFERENTIATE THE COMPRESSOR COMPONENTS ACCORDING TO THE DIFFERENT CONSTRUCTION MATERIALS (PLASTIC, COPPER, IRON, OIL FILTER, AIR FILTER ETC…)

SAFETY PRECAUTIONS FOR THE CONNECTIVITY MODULE
IT IS IMPORTANT TO FOLLOW ALL REGULATIONS REGARDING THE USE OF RADIO EQUIPMENT, IN PARTICULAR REGARDING THE POSSIBILITY OF RADIO FREQUENCY (RF) INTERFERENCE. PLEASE FOLLOW THE SAFETY ADVICE GIVEN BELOW CAREFULLY.

- **RESPECT RESTRICTIONS ON THE USE OF RADIO EQUIPMENT IN FUEL DEPOTS, CHEMICAL PLANTS OR OTHER EXPLOSIVE ENVIRONMENTS.**
- **AVOID OPERATION CLOSE TO INADEQUATELY PROTECTED PERSONAL MEDICAL DEVICES SUCH AS HEARING AIDS AND PACEMAKERS. CONSULT THE MANUFACTURERS OF THE MEDICAL DEVICE TO DETERMINE IF IT IS ADEQUATELY PROTECTED.**
- **AVOID OPERATION CLOSE TO OTHER ELECTRONIC EQUIPMENT WHICH MAY ALSO CAUSE INTERFERENCE IF THE EQUIPMENT IS INADEQUATELY PROTECTED. OBSERVE ANY WARNING SIGNS AND MANUFACTURER RECOMMENDATIONS.**
- **RESPECT A DISTANCE FROM THE HUMAN BODY OF AT LEAST 20 CM (8 INCH) DURING OPERATION.**

BEFORE ANY MAINTENANCE, REPAIR WORK, ADJUSTMENT, OR ANY OTHER NON-ROUTINE CHECKS, SWITCH THE CONTROLLER IN SERVICE MODE. (Following procedure as per paragraph 14.4.16)

The manufacturer does not accept responsibility for damage caused as a result of negligence or failure to abide by the instructions given above.

AIR RECEIVER AND SAFETY VALVE:

- To limit internal corrosion, which could compromise the safety of the compressed air tank, **the condensation that is produced must be discharged at least once a day**. If an automatic drain fitted to the air receiver is present, it is necessary to check that it is working correctly every week and repair it if necessary.
- **The thickness of the receiver must be checked every year and also in accordance with legislation in force in the country where the receiver is installed.**
- **The tank cannot be used and must be replaced if the thickness falls below the minimum level given in the instruction documents for the tank.**
- The tank can be used within the temperature limits given in the conformity declaration.
- **The safety valves of the air receiver and oil receiver must be checked every year and replaced** in accordance with legislation in force.

NOT RESPECTING THE ABOVE MENTIONED PRESCRIPTION CAN RESULT IN AIR RECEIVER BURSTING HAZARD.

The manufacturer does not accept responsibility for damage caused as a result of negligence or failure to abide by the instructions given above.

1.0 GENERAL CHARACTERISTICS

The compressor units use single-stage screw rotary air compressors with oil injection.
The system is self-bearing and does not require bolts or other devices to anchor it to the floor.
The unit is completely assembled in the factory; the necessary connections for setting it up are:

- connection to the power mains (see installation chapter)
- connection to the compressed air network (see installation chapter)

2.0 INTENDED USE

The compressor has been built to supply compressed air for industrial use.
The machine cannot be used in premises where there is a risk of fire or explosion, or where the activity performed can release into the environment dangerous substances (for example: solvents, inflammable vapours, alcohol, etc.).
In particular the appliance cannot be used to produce air to be breathed by humans or used on direct contact with foodstuffs. These uses are allowed if the compressed air produced is filtered by means of a suitable filtering system (Consult the manufacturer for these special uses.)
This appliance must be used only for the purpose for which it was specifically designed.
All other uses are to be considered incorrect and therefore unreasonable.
The Manufacturer cannot be held responsible for any damage resulting from improper, incorrect or unreasonable use.

3.0 OPERATION

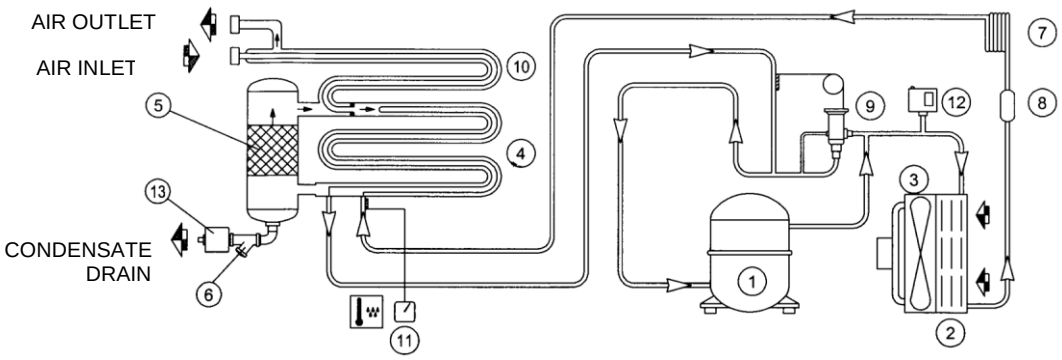
3.1 OPERATION FOR COMPRESSOR

The electric motor and the compressor unit are coupled by means of a belt transmission.
The compressor unit takes in the outside air through the suction valve. The intake air is filtered by the filter cartridge fitted upstream from the intake valve. Inside the compressor unit, the air and the lubricating oil are compressed and sent to the oil separating tank where the oil is separated from the compressed air; the air is then filtered again by the oil separating cartridge to reduce the amount of suspended oil particles to a minimum. The machine is fitted with a suitable air-cooling system.
The machine is protected by a special safety thermostat: if the oil temperature reaches 120°C the machine cuts out automatically.

3.2 OPERATION FOR DRYER

At the moment of use the air flows from the tank to the drier and is then dried and sent to the distribution network. Dryer operation is described below. The gaseous refrigerant coming from the evaporator (4) is sucked by the refrigeration compressor (1) and it is pumped into the condenser (2). This one allows its condensation, eventually with the help of the fan (3); the condensed refrigerant passes through the dewatering filter (8) and it expands through the capillary tube (7) and goes back to the evaporator where it produces the refrigerating effect.
Due to the heat exchange with the compressed air which passes through the evaporator against the stream, the refrigerant evaporates and goes back to the compressor for a new cycle.
The circuit is equipped with a bypass system for the refrigerant; this intervenes to adjust the available refrigerating capacity to the actual cooling load.
This is achieved by injecting hot gas under the control of the valve (9): this valve keeps constant the pressure of the refrigerant in the evaporator and therefore also the dew point never decreases below 0 °C in order to prevent the condensate from freezing inside the evaporator.
The drier runs completely automatically; it is calibrated in the factory for a dew point of ~ 3 °C and therefore no further calibrations are required.

DRYER FLOW DIAGRAM



4.0 GENERAL SAFETY STANDARDS

The appliance may be used only by specially trained and authorized personnel.
Any tampering with the machine or alterations not approved beforehand by the Manufacturer relieve the latter of responsibility for any damage resulting from the above actions.
The removal of or tampering with the safety devices constitutes a violation of the European Standards on safety.

ENSURE THAT THERE ARE DISCONNECTOR SWITCH AND FUSES UPSTREAM THE MACHINE. FOR DETAILS (SIZE AND TYPE) SEE WIRING/SERVICE DIAGRAM.

ALL WORK ON THE ELECTRIC PLANT, HOWEVER SLIGHT, MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONEL.

5.0 DESCRIPTION OF DANGER SIGNALS

	**1)** FLUID EJECTION		**6)** HIGH PRESSURE
	**2)** DANGEROUS ELECTRIC VOLTAGE		**7)** HOT PARTS
	**3)** AIR NOT FIT FOR BREATHING		**8)** MOVING PARTS
	**4)** NOISE		**9)** FAN ROTATING
	**5)** MACHINE WITH AUTOMATIC START		**10)** PURGE EVERY DAY

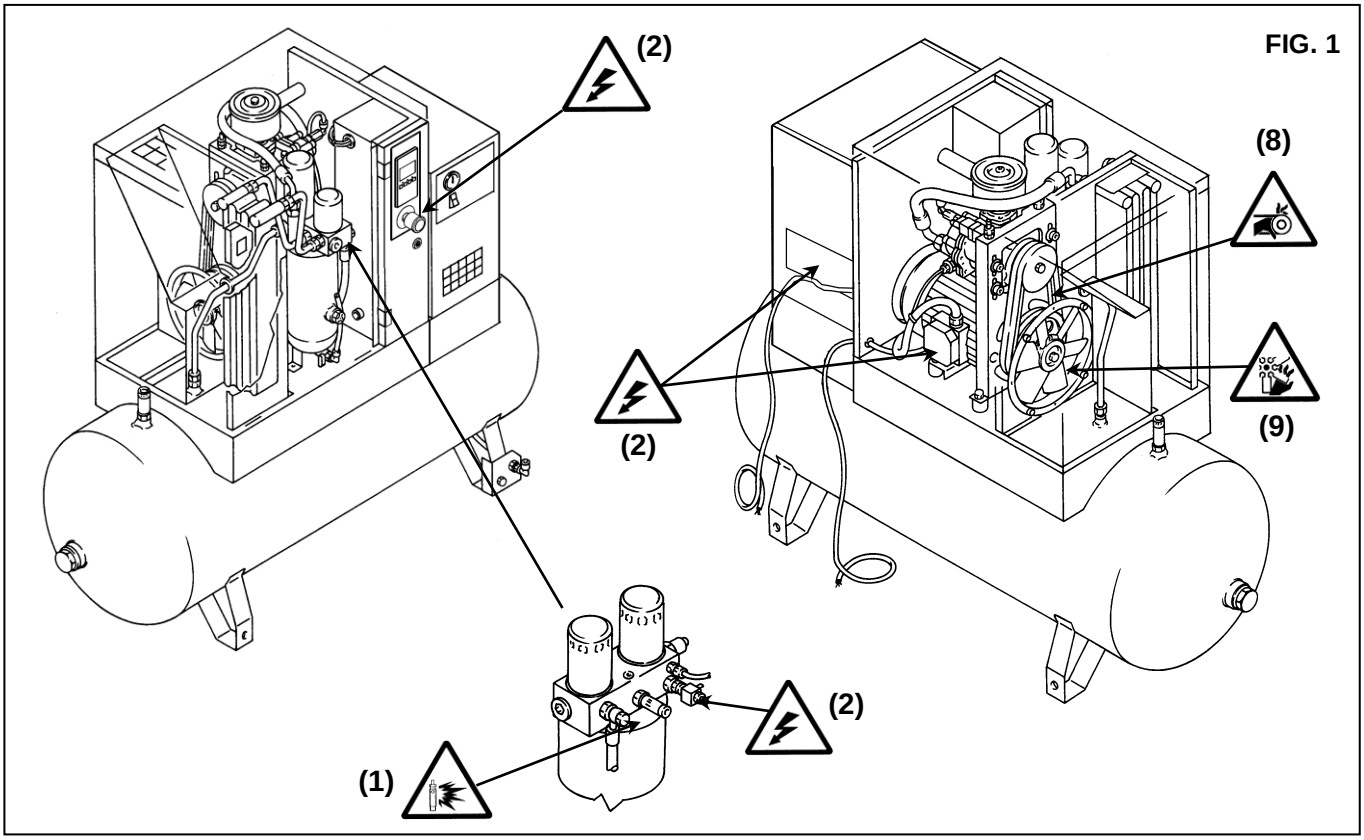
5.1 DESCRIPTION OF COMPULSORY SIGNALS

	**11)** READ THE USE AND MAINTENANCE INSTRUCTIONS		

6.0 DANGERS ZONES

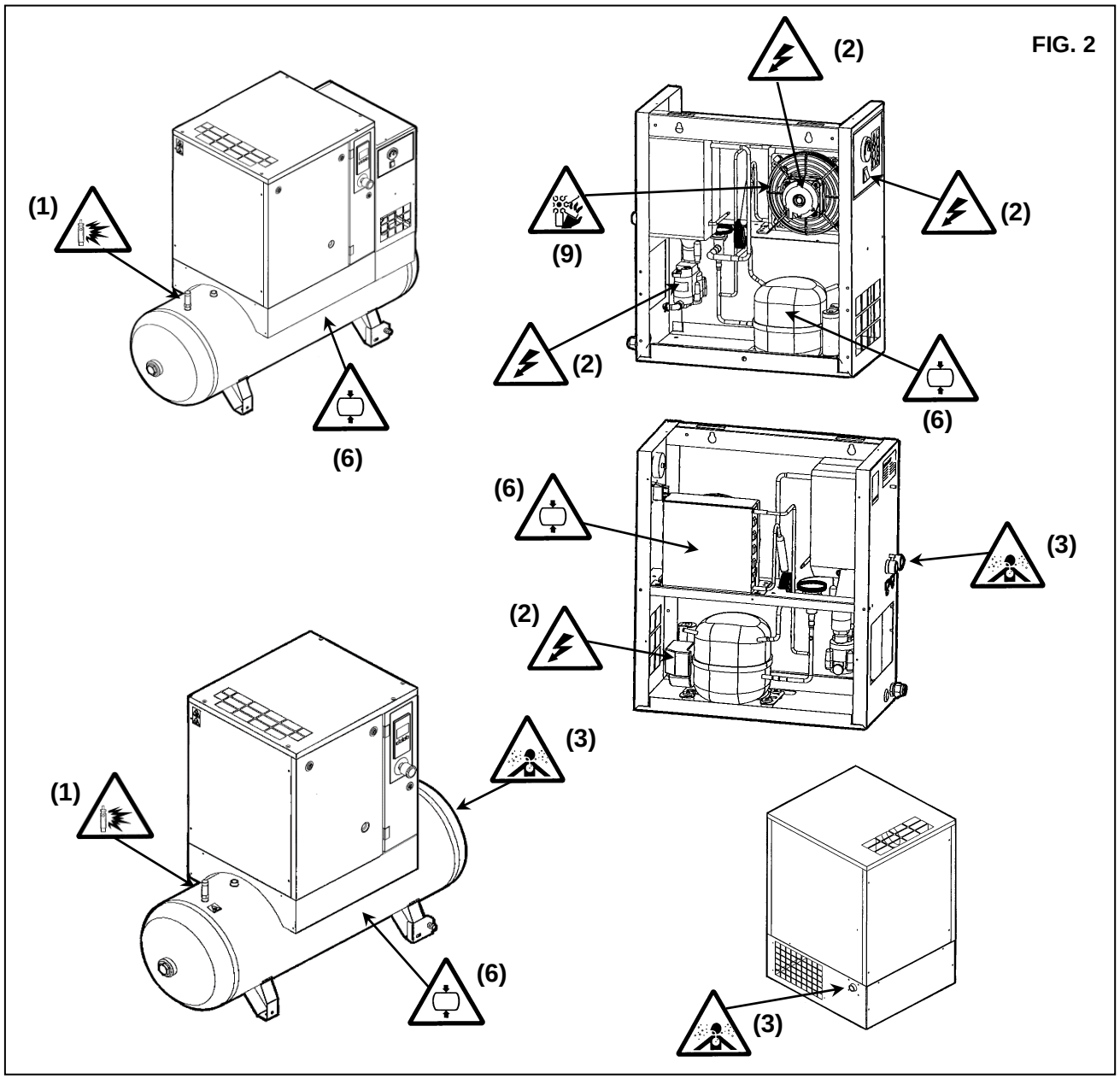
6.1 DANGERS ZONES FOR COMPRESSOR UNIT (FIG. 1)

Risks present on the whole machine



6.2 DANGERS ZONES FOR DRIER UNIT AND TANK (FIG.2)

Risks present on the whole machine



7.0 SAFETY DEVICES

7.1 SAFETY DEVICES FOR SCREW COMPRESSOR (FIG. 3)

1) Safety screws
2) The front protection can be opened with a special key
3) Fixed protection device - cooling fan / pulley
4) Safety valve
5) Emergency stop
6) Oil filling cap (with safety breather)

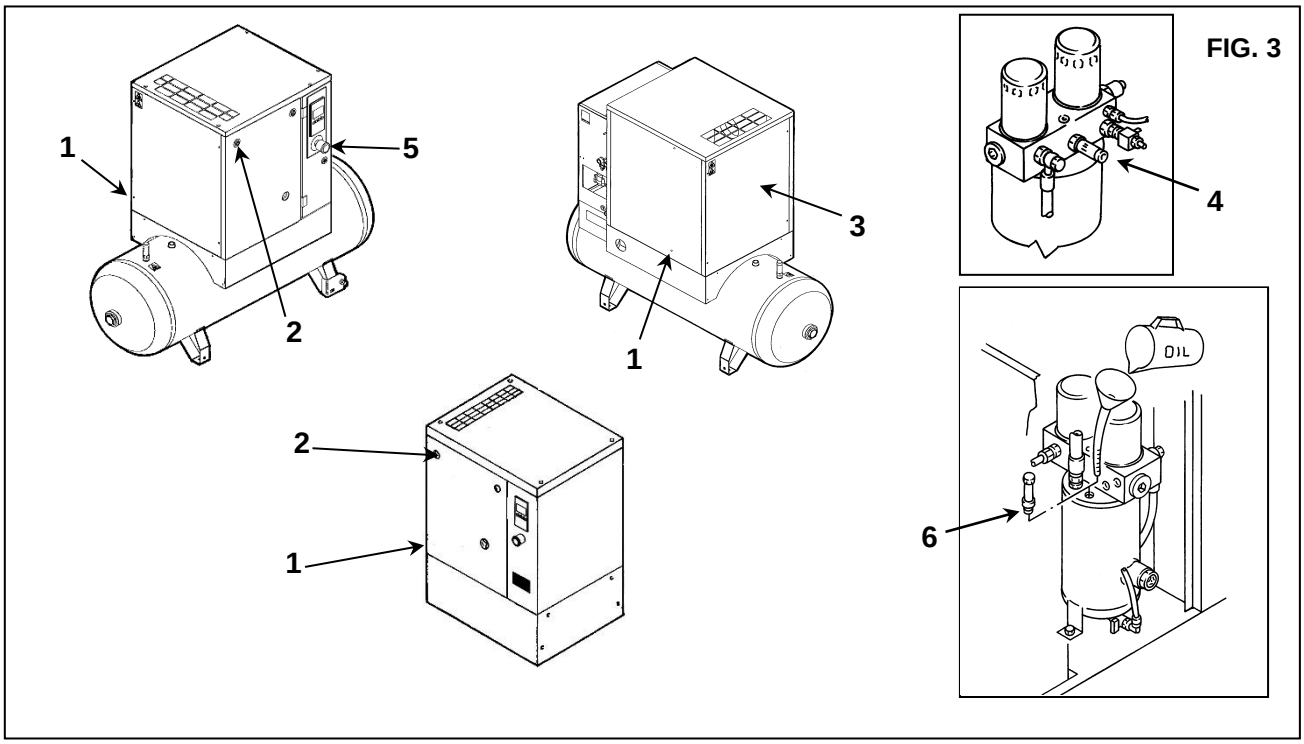


FIG. 3

7.2 SAFETY DEVICES FOR DRYER UNIT AND TANK (FIG.4)

1) Safety valve
2) Protective switch cap.
3) Relay for compressor (automatic)
4) Overload protector for compressor

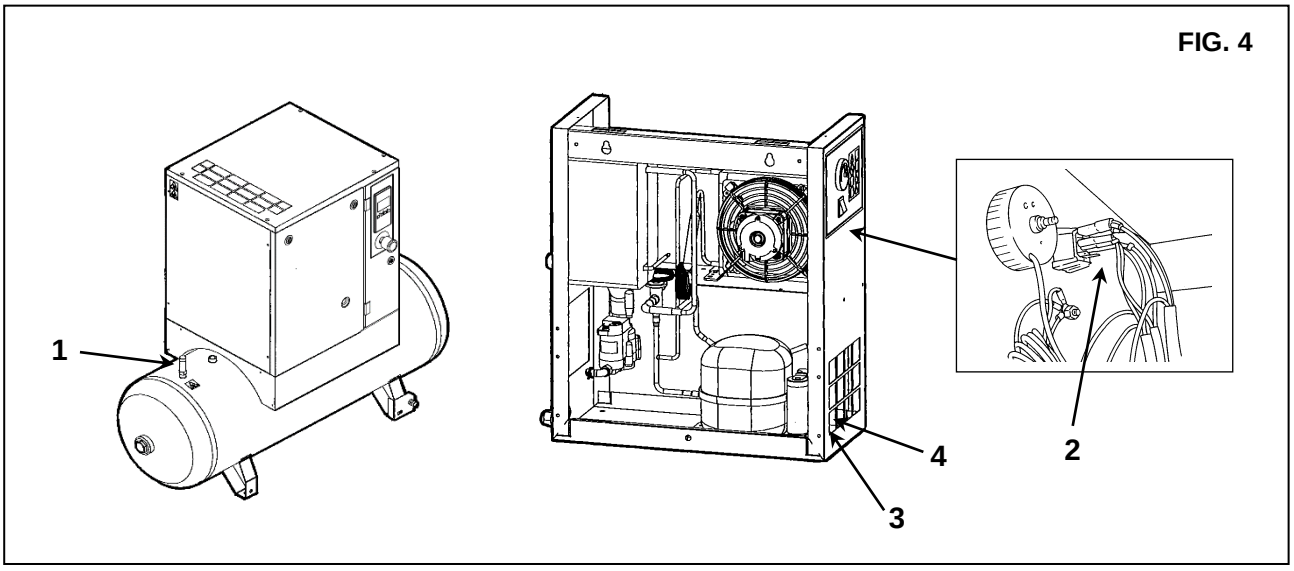


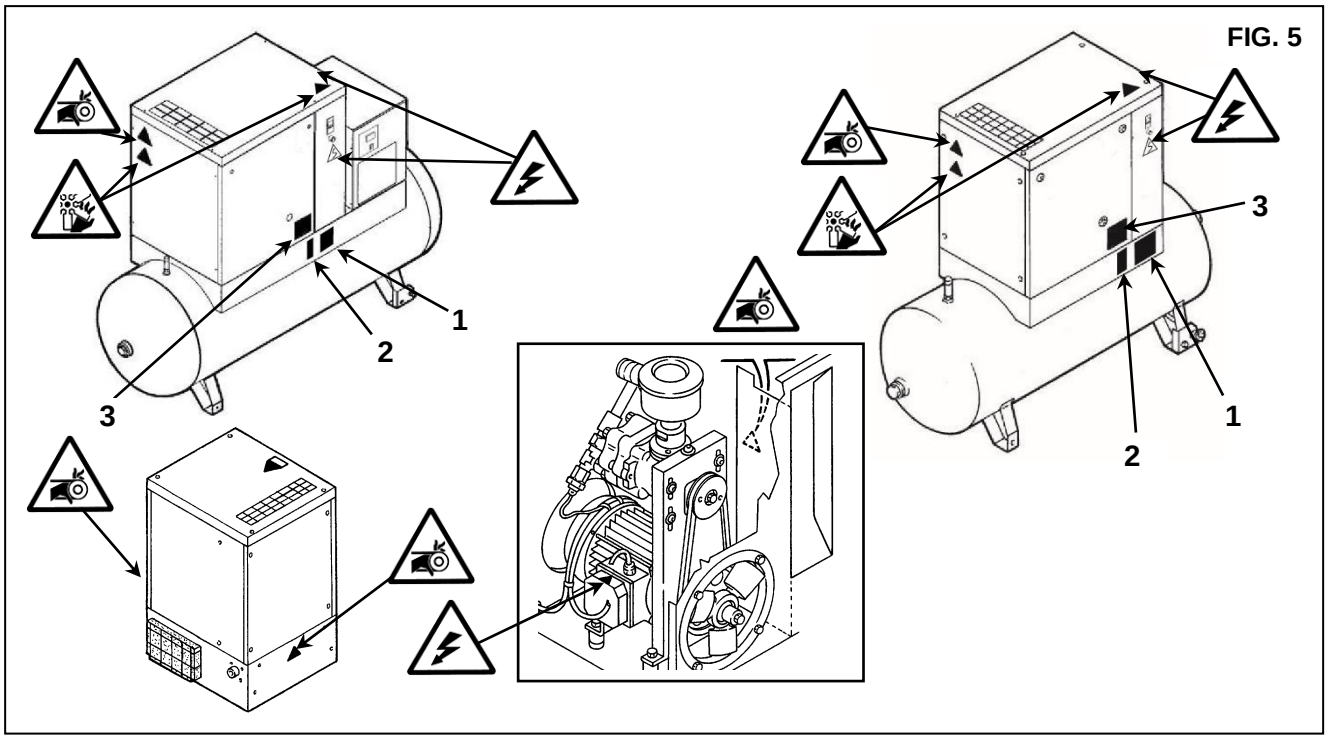
FIG. 4

8.0 POSITION OF PLATES

8.1 POSITION OF THE DANGER PLATES FOR COMPRESSOR UNIT (FIG.5)

The plates fitted on the compressor unit are part of the machine; they have been applied for safety purposes and must not be removed or spoiled for any reason.

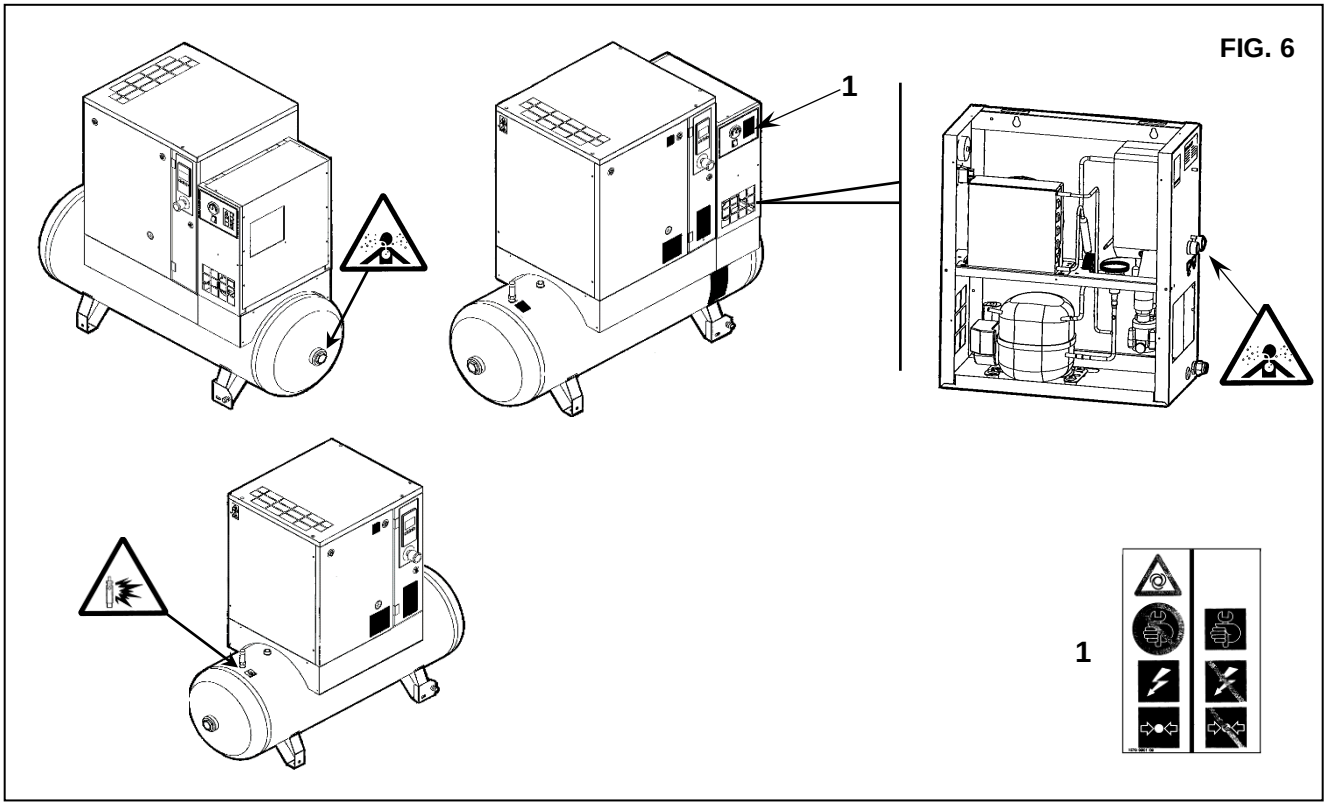
1) Dangers plate Code 2202 2607 90
2) Plate “Machine with automatic start” Code 2202 2510 89
3) Label ARAVF Automatic restart after voltage failure 1079 9932 74



8.2 POSITION OF THE DANGER PLATES FOR DRYER UNIT AND TANK (FIG.6)

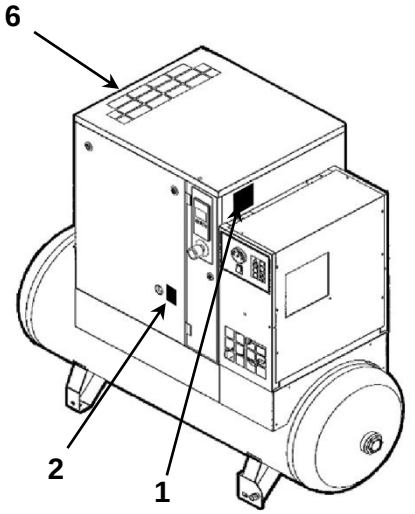
The plates fitted on the compressor unit are part of the machine; they have been applied for safety purposes and must not be removed or spoiled for any reason.

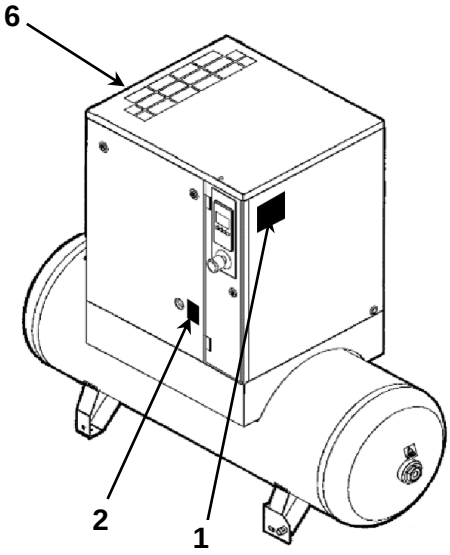
1) Dangers plate 1079 9926 55

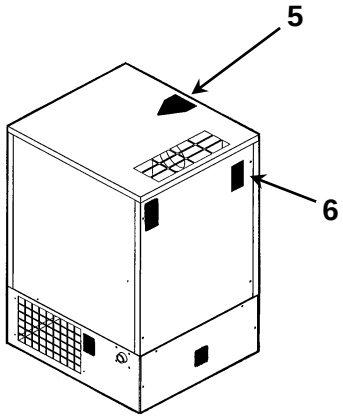


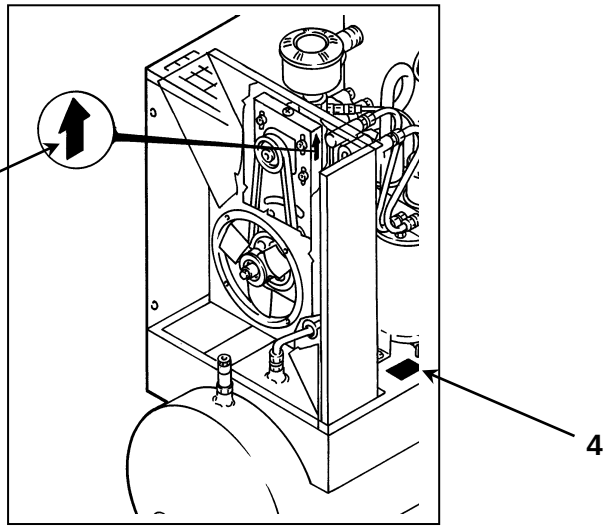
8.3 POSITION OF THE DATA PLATE FOR COMPRESSOR UNIT (FIG.7)

FIG. 7

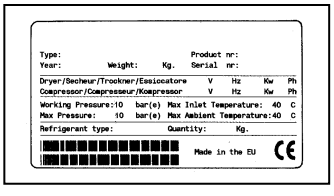






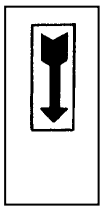


6



1

2



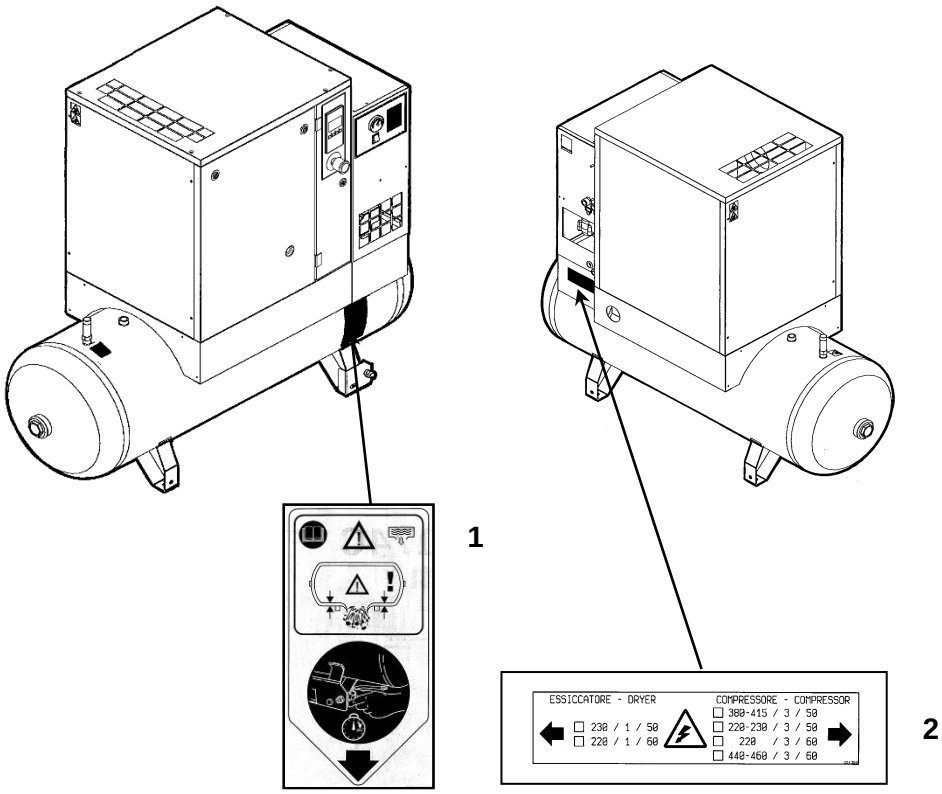
3

4

5

8.4 POSITION OF THE DATA PLATE FOR DRYER – AIR RECEIVER (FIG. 8)

FIG. 8



9.0 COMPRESSOR ROOM

9.1 FLOOR

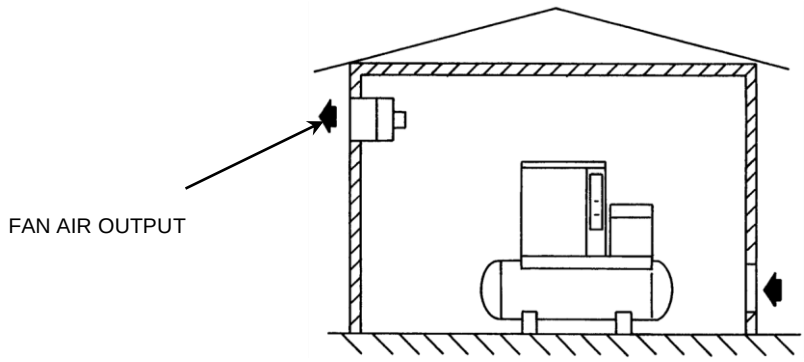
The floor must be even and of industrial type; the total weight of the machine is shown in the Chap. 13.0
Remember the total weight of the machine when positioning it.

9.2 VENTILATION

When the machine is operating, the room temperature must not be higher than **46 °C** or lower than **5 °C.**
The volume of the room must be about **30 m^3**
The room must be provided with 2 openings for ventilation with a surface area of about **0,5 m^2** each.
The first opening must be in a high position to evacuate the hot air, the second opening must be low to allow the intake of external air for ventilation.
If the environment is dusty it is advisable to fit a filtering panel on this opening.

9.3 EXAMPLES OF VENTILATION OF THE COMPRESSOR ROOM (FIG.9)

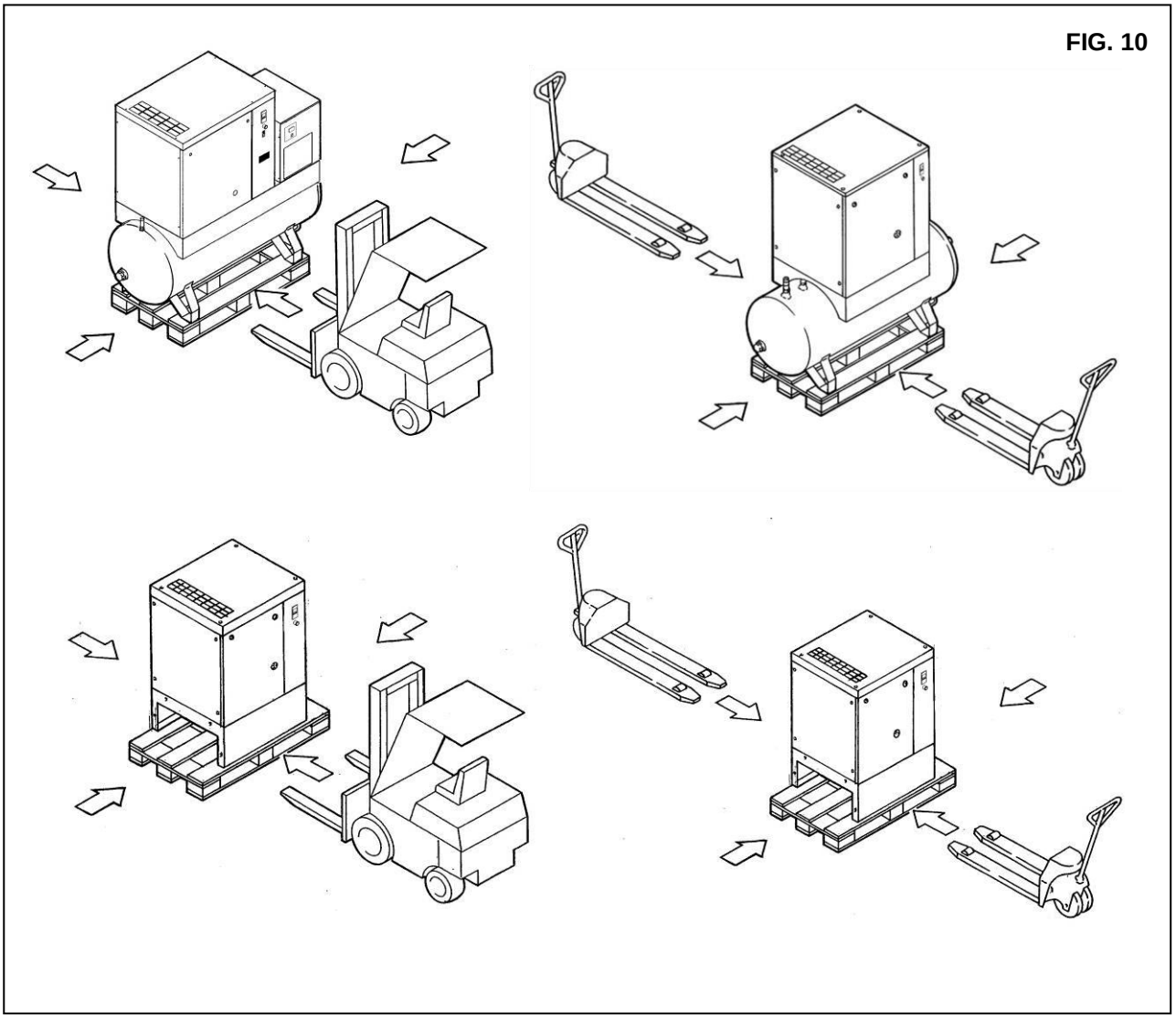
FIG. 9



10.0 TRANSPORT AND HANDLING (FIG.10)

The machine must be transported as shown in the following figures.

FIG. 10



11.0 UNPACKING

After removing the packing, ensure that the machine is unbroken and that there are no visibly damaged parts.
If you are in doubt, do not use the machine but apply to the manufacturer technical assistance service or to your dealer. The packing material (plastic bags, polystyrene foam, nails, screws, wood, metal strapping, etc..) must not be left within the reach of children or abandoned in the environment, as they are a potential source of danger and pollution.
Dispose of these materials in the approved collection centres.

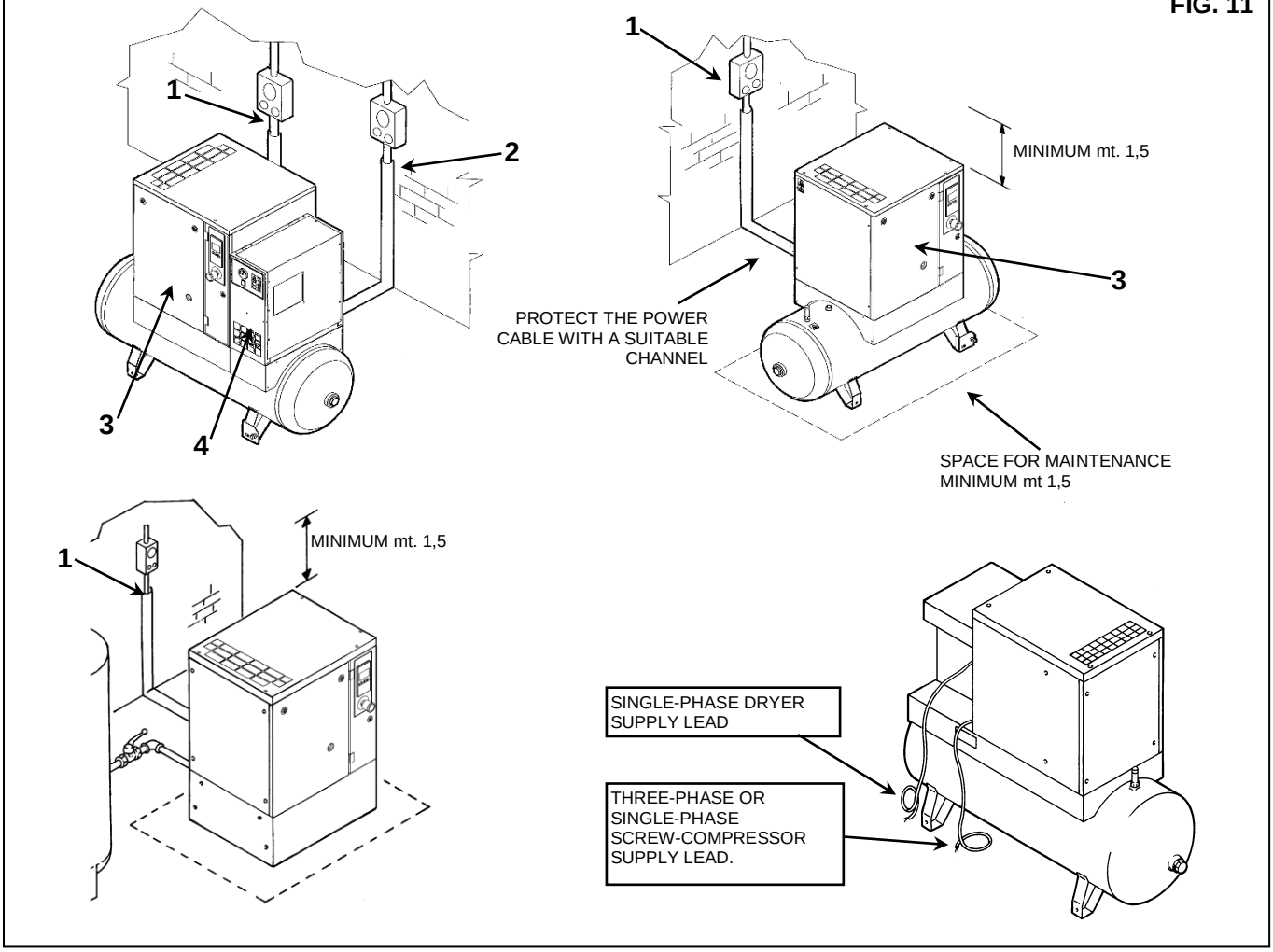
12.0 INSTALLATION

12.1 POSITIONING

After unpacking the equipment and preparing the compressor room, put the machine into position, checking the following items:

- **Ensure that there is sufficient space around the machine to allow maintenance (see FIG. 11).**
- **Check that the compressor is standing on a perfectly flat floor.**

FIG. 11



ENSURE THAT THE OPERATOR CAN SEE THE WHOLE MACHINE FROM THE CONTROL PANEL AND CHECK THE PRESENCE OF ANY UNAUTHORIZED PERSONS IN THE PROXIMITY OF THE MACHINE.

12.2 ELECTRICAL CONNECTION

- Check that the supply voltage is the same as the value indicated on the machine data plate.
  CAUTION: the compressor Ref. 3 and the dryer Ref. 4 have two separate supply, respectively three-phase or single-phase and single-phase.
- Check the condition of the line leads and ensure that there is an efficient earth lead.
- **Ensure that there are disconnector switch and fuses upstream the machine (see Ref. 1 for compressor, Ref. 2 for dryer Fig. 11). For details (size and type), see wiring/service diagram.**
- Connect the machine power cables with the greatest care, according to the standards in force.
  These cables must be as indicated on the machine wiring diagram.
- Connect the cables to the charging clamps on the electric panel and make sure they are properly tightened. After the first 50 working hours, check that the screws on the electric terminals are tight

ONLY PROFESSIONALLY SKILLED PERSONNEL MAY HAVE ACCESS TO THE ELECTRIC PANEL. SWITCH OFF THE POWER BEFORE OPENING THE DOOR OF THE ELECTRIC PANEL.

COMPLIANCE WITH THE REGULATIONS IN FORCE CONCERNING ELECTRIC PLANTS IS FUNDAMENTAL FOR OPERATOR SAFETY AND FOR THE PROTECTION OF THE MACHINE.

CABLES, PLUGS AND ALL OTHER TYPE OF ELECTRIC MATERIAL USED FOR THE CONNECTION MUST BE SUITABLE FOR THE USE AND COMPLYING WITH THE REQUIREMENTS STATED BY THE REGULATIONS IN FORCE.

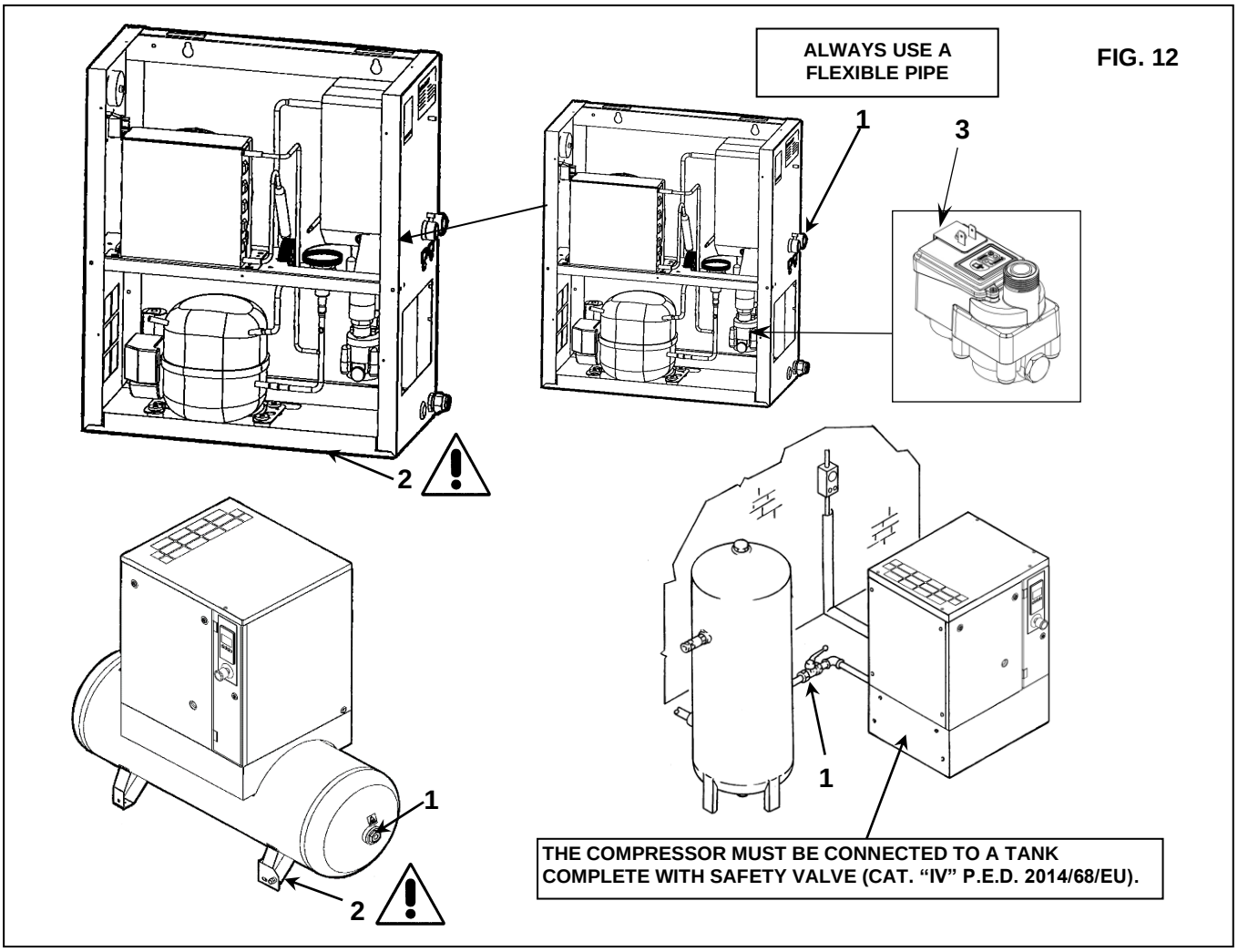
THE STANDARD VOLTAGE CONFIGURATION FOR THE COMPRESSOR IS MENTIONED ON THE DATA PLATE OF THE MACHINE.

NEVER OPERATE THE COMPRESSOR ON A VOLTAGE OTHER DIFFERENT THAN SHOWN ON THE ELECTRIC CABINET.

12.3 CONNECTION TO THE COMPRESSED AIR NETWORK

Fit a manual interception valve Ref. 1 between the machine and the compressed air network so that the compressor may be isolated during maintenance operations; (see figure 12).

PIPES, FITTINGS AND CONNECTIONS USED FOR THE CONNECTION OF THE ELECTROCOMPRESSOR TO THE COMPRESSED AIR NETWORK MUST BE SUITABLE TO THE USE ACCORDING TO THE PRESCRIPTIONS OF THE REGULATIONS IN FORCE IN THE COUNTRY OF USE.



The manual drainage Ref. 2 Fig. 12 the condensate automatic Ref. 3 Fig. 12, are led outside the machine with a flexible pipe that may be inspected. Drainage must comply with the local regulations in force.

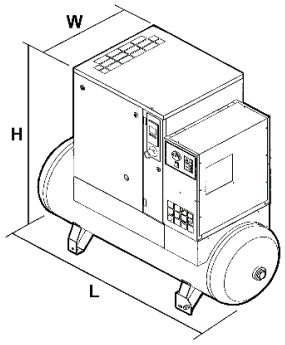
ALL DAMAGE DUE TO THE FAILURE TO COMPLY WITH THESE INDICATIONS CANNOT BE ATTRIBUTED TO THE MANUFACTURER AND MAY CAUSE INVALIDITY OF THE GUARANTEE CONDITIONS.

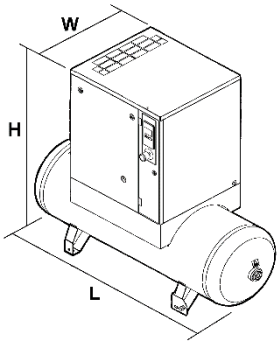
12.4 STARTING UP

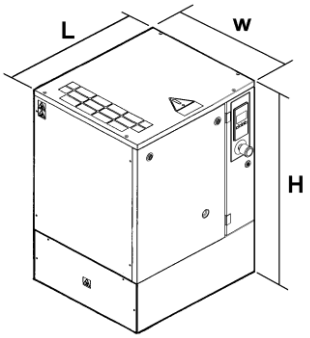
See part B of this manual, **Chapter 20.0**

13.0 DIMENSIONS AND TECHNICAL DATA

air receiver 200-270 Liters	*on base*







HP 3-4-5,5-7,5-10 ***KW 2,2-3-4-5,5-7,5***	**Dimensions** mm (inch)				
	L	**W (1)**	**W (2)**	**H**	air connection
On base frame	620 (24,4)	630 (24,8)	665 (26,2)	975 (38,4)	3/4”
Air Receiver 200L	1430 (56,3)	600 (23,6)	665 (26,2)	1285 (50,6)	1/2”
Air Receiver 270L	1540 (60,6)	600 (23,6)	665 (26,2)	1375 (54,1)	1/2”
W (1) = standard canopy W (2) = 7,5HP(5,5kW) 60Hz ; 10HP(7,5kW) 50-60Hz					

	HP 3 ***kW 2,2***		**HP 4** ***kW 3***		**HP 5,5** ***kW 4***		**HP 7,5** ***kW 5,5***		**HP 10** ***kW 7,5***	
Setting pressure *bar(e)*	*7.5*	*9.5*	*7.5*	*9.5*	*7.5*	*9.5*	*7.5*	*9.5*	*7.5*	*9.5*
Setting pressure *PSI*	*109*	*138*	*109*	*138*	*109*	*138*	*109*	*135*	*109*	*138*
Free air delivery **l/min.**	360	293	460	361	581	503	894	758	1035	965
Free air delivery **cfm.**	12.7	10.4	16.1	13.2	20.5	17.8	31.6	26.8	36.5	34.1
Approx.weight **(no dryer, 200L air receiver) Kg (lb)**	165 (364)		170 (375)		175 (386)		185 (408)		195 (430)	
Approx.weight **(with dryer, 200L air receiver) Kg (lb)**	190 (419)		195 (430)		200 (441)		210 (463)		225 (496)	
Approx.weight **(on base frame) Kg (lb)**	110 (243)		115 (254)		120 (265)		130 (287)		140 (309)	
Sound pressure level, tank-mounted units **(according to ISO 2151 (2004)) @ 70% of maximum speed dB(A)**	59		59		60		62		63	
Sound pressure level, tank-mounted units **(according to ISO 2151 (2004)) @ maximum speed dB(A)**	67		67		68		70		71	
Setting controller **°C (°F)**	*110 ÷ 115 (230 ÷ 239)*									
Oil capacity **L (gal)**	~ 2,5 (0,66)						~ 3,2 (0,83)			
The weight above refers to the standard unit IEC V400 / 3 / 50Hz, PED (CE) approval. The weight may vary according to the voltage variant and approval of the pressure equipment. Weight air receiver 270L : add 35kg (77lb)										

HP (kW)	Dryer type	Weight Kg. (lb)	Freon R-513A Kg. (lb)			Nominal power W (HP)			Nominal power W (HP)			Nominal power W (HP)			bar (psi) MAX.
			230/50 Hz	230/60 Hz	115/60 Hz	230/50 Hz	230/60 Hz	115/60 Hz	230/50 Hz	230/60 Hz	115/60 Hz	230/50 Hz	230/60 Hz	115/60 Hz	
3-4-5,5 (2,2-3-4)	A1	19 (41,9)	0,170 (0,37)	0,170 (0,37)	0,180 (0,40)	135 (0,18)	125 (0,168)	121 (0,162)	29 (0,038)	42 (0,056)	38 (0,051)	164 (0,220)	167 (0,224)	159 (0,213)	16 (232)
7,5 (5,5)	A2	20 (44,1)	0,290 (0,64)	0,290 (0,64)	0,290 (0,64)	161 (0,22)	173 (0,232)	148 (0,198)	29 (0,038)	49 (0,066)	45 (0,060)	190 (0,255)	222 (0,298)	193 (0,259)	16 (232)
10 (7,5)	A3	25 (55,1)	0,350 (0,77)	0,350 (0,77)	0,350 (0,77)	233 (0,31)	252 (0,338)	251 (0,337)	33 (0,044)	54 (0,072)	50 (0,067)	266 (0,356)	306 (0,410)	301 (0,404)	16 (232)

Reference conditions:
Ambient temperature 25 °C (77 °F)
Inlet air temperature 35 °C (95 °F)
Pressure 7 bar (102 psi)
Dew point in pressure 5 °C (41 °F)

Limit conditions:
Max. ambient temperature 46 °C (115 °F)
Min. ambient temperature 5 °C (41 °F)
Max. inlet air temperature 55 °C (131 °F)
Max. working pressure = factory setting pressure + 0.5 bar (7PSI)

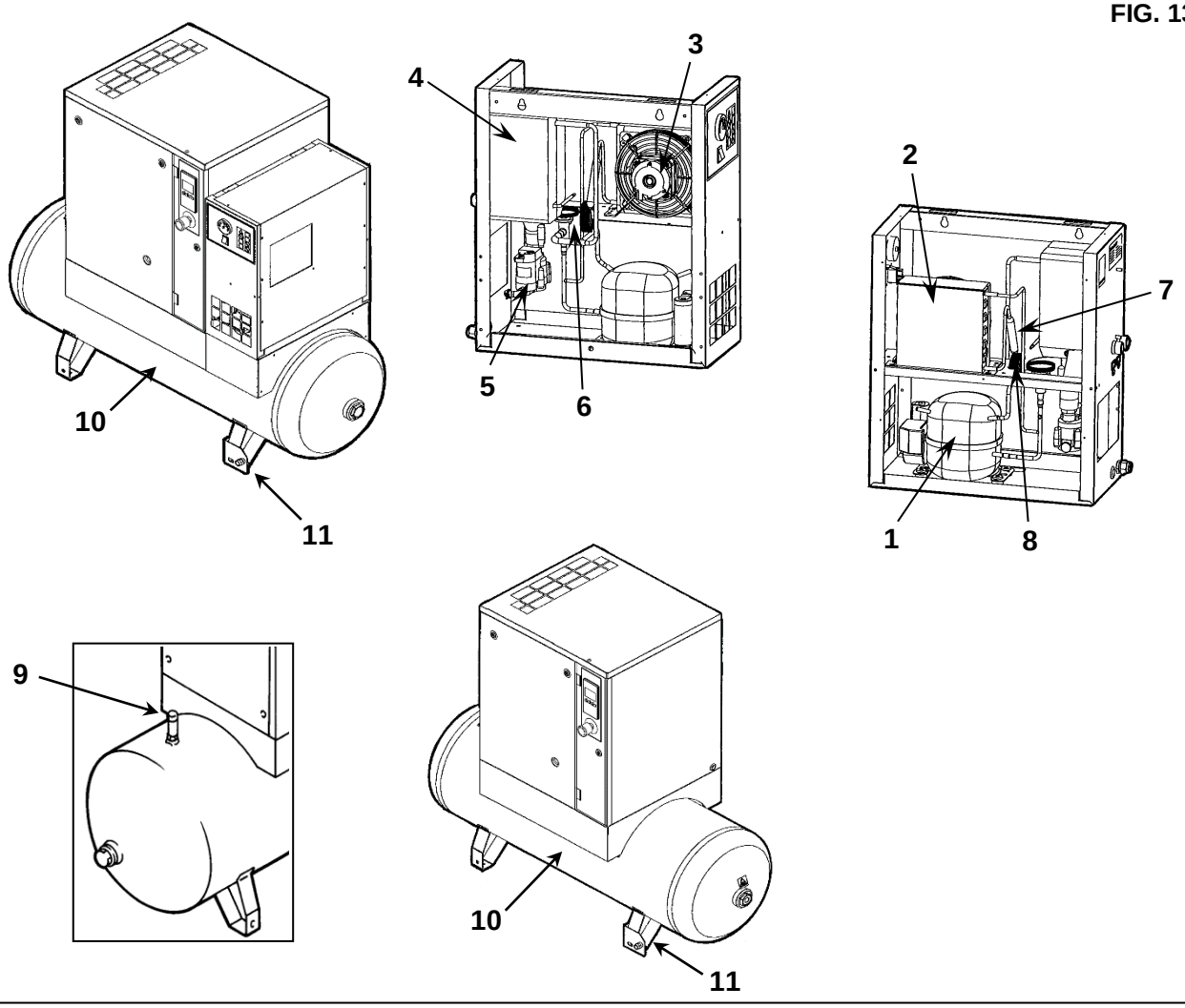
14.0 MACHINE ILLUSTRATION

14.1 GENERAL LAY-OUT FOR DRYER AND TANK (FIG.13)

1 Refrigerant compressor
2 Condenser
3 Motor fan
4 Evaporator
5 Condensate drain solenoid valve
6 Hot gas bypass valve
7 Refrigerant filter
8 Expansion capillary tube
9 Safety valve (Compressed air tank) ✱
10 Compressed air tank
11 Condensate manual drainage

✱ IT IS FORBIDDEN TO TAMPER WITH THE SETTING VALUES OF THE SAFETY VALVE

FIG. 13

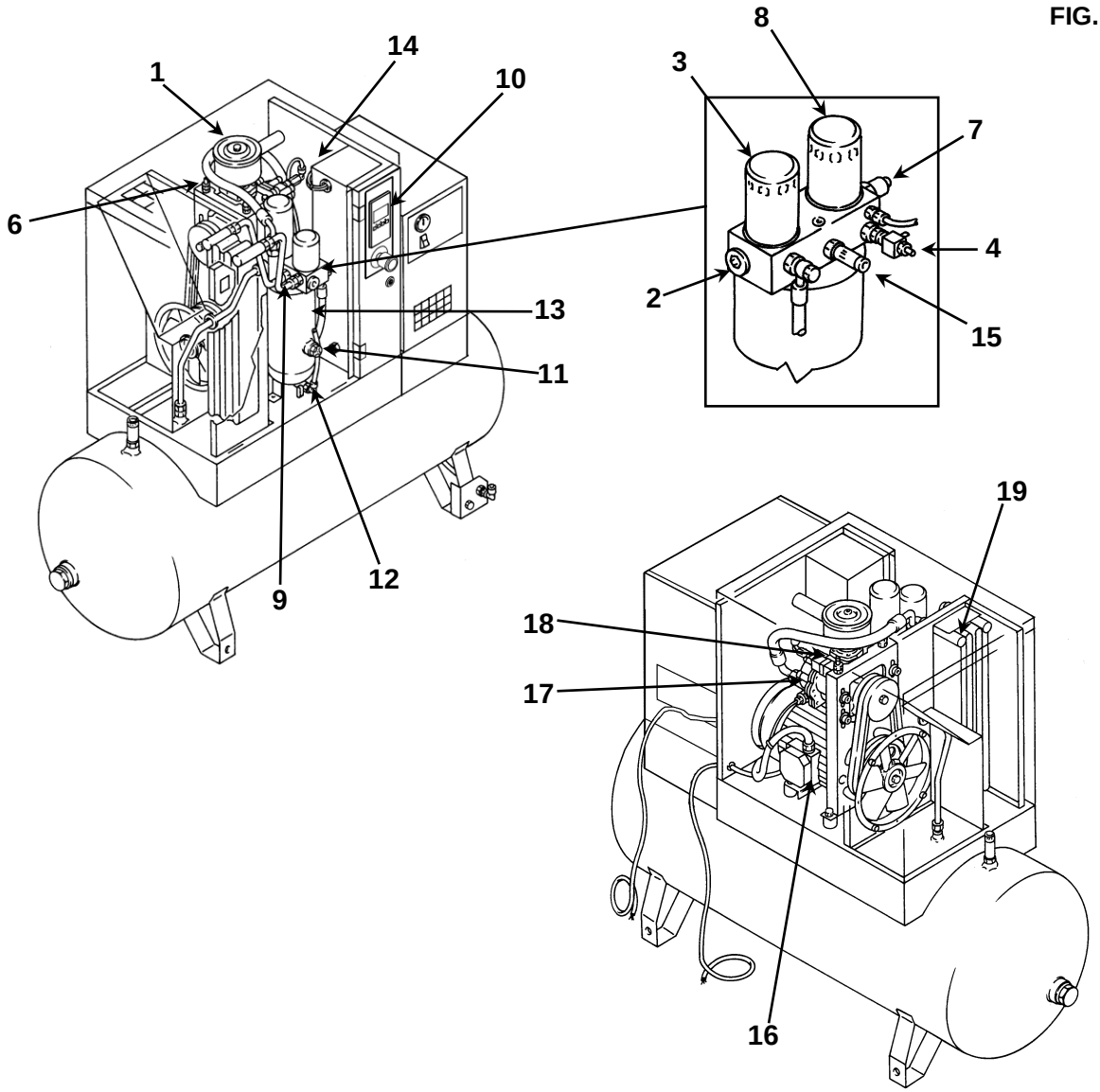


14.2 GENERAL LAY-OUT FOR SCREW COMPRESSOR (FIG.14)

1 Air suction filter
2 Thermostatic valve
3 Oil filter
4 No-load running solenoid valve
6 Belt tightening system
7 Minimum pressure valve
8 Air-oil separator filter
9 Top-up or oil filling cap
10 Control panel
11 Oil gauge
12 Oil discharge
13 Oil tank
14 Pressure sensor
15 Safety valve ✱
16 Electric motor
17 Screw compressor
18 Suction unit
19 Oil cooler

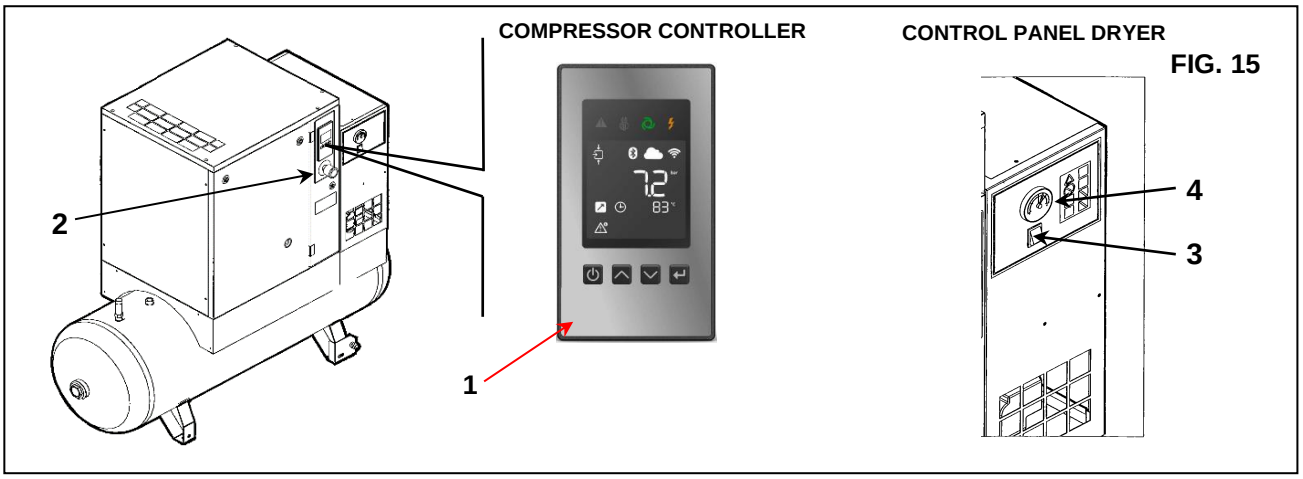
✱ IT IS FORBIDDEN TO TAMPER WITH THE SETTING VALUES OF THE SAFETY VALVE

FIG. 14



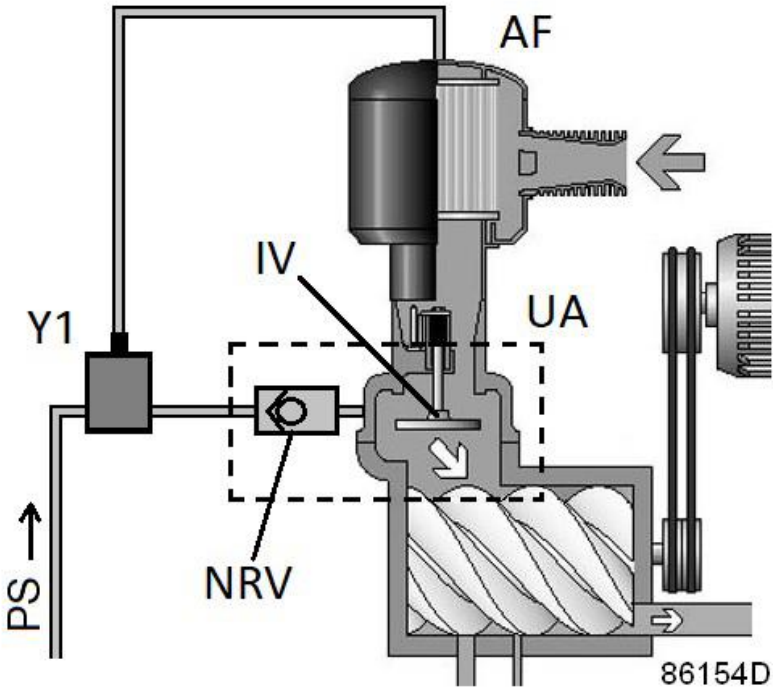
14.3 COMMAND AND CONTROL PANEL (FIG.15)

BEFORE CARRYING OUT THE OPERATION TEST, READ CAREFULLY AND GET A GOOD KNOWLEDGE OF THE CONTROL FUNCTIONS.



1) Electronic controller
2) Emergency stop button with rotate-to-unlatch mechanism
3) Dryer's "OFF - ON" switch
4) Dew point indicator

14.4 REGULATIG SYSTEM



The main components of the regulating system are:

- Unloader (UA), including inlet valve (IV) and non-return valve (NRV).
- Loading solenoid valve (Y1), normally open.
- Pressure signal (PS) from the instrument block.
- The controller that regulates the compressor based on the pressure settings and readings of the pressure sensor.

When the compressor is started and the net pressure is below the setpoint, the motor speed increases until the net pressure reaches the setpoint or until the maximum motor speed is reached.

If the air consumption is less than the air delivery of the compressor, the net pressure increases further.

When the net pressure reaches the setpoint (desired net pressure) and continues to rise, the regulator decreases the motor speed.

When the pressure continues to increase although the motor already operates at minimum speed, the regulator will close the inlet valve (IV) and the compressor will run in unloading condition, as soon the net pressure reaches a value, equal to the setpoint plus the indirect stop level (typically 0.5 bar above the setpoint). If the pressure will not decrease below the setpoint, after 30 seconds of unloading condition, the regulator will stop the main motor.

If the compressor was stopped in automatic operation and the net pressure approaches the setpoint, the regulator starts the motor again. The quicker the net pressure drops, the quicker the compressor will restart.

Should the net pressure rise very quickly to a value equal to the setpoint plus the direct stop level (typically 1 bar above the setpoint), the compressor is stopped immediately (without first decreasing the motor speed).

See section Calling up/ modifying pressure band settings.

14.5 COMPRESSOR CONTROLLER

FIG. 16

14.5.1 INTRODUCTION

In general, the controller has following functions:

- Controlling the unit
- Protecting the unit
- Monitoring components subject to service
- Automatic restart after voltage failure (ARAVF)
- Integrated connectivity (Bluetooth 4.2, Wi-Fi 802.11 b/g/n or Ethernet RJ45)

AUTOMATIC CONTROL OF THE UNIT

The controller maintains the net pressure at the programmable setpoint by adapting the motor speed and automatically loading and
unloading the unit.

A number of programmable settings, e.g. the unloading and loading pressures, the minimum stop time and the maximum number of motor starts are taken into account.

The controller stops the unit whenever possible to reduce the power consumption and restarts it automatically when the net pressure decreases. If the expected unloading period is too short, the unit is kept running to prevent too short standstill periods.

A NUMBER OF TIME BASED AUTOMATIC START/STOP COMMANDS MAY BE PROGRAMMED. TAKE INTO ACCOUNT THAT A START COMMAND WILL BE EXECUTED (IF PROGRAMMED AND ACTIVATED), EVEN AFTER MANUALLY STOPPING THE UNIT.

PROTECTING THE COMPRESSOR

SHUTDOWN

If the outlet element temperature exceeds the programmed shutdown level, the unit will be stopped. This will be indicated on the display of the controller.

The unit will also be stopped in case of overload of the drive motor.

BEFORE REMEDYING, CONSULT THE SAFETY PRECAUTIONS.
BEFORE RESETTING A WARNING OR SHUTDOWN MESSAGE, AN AUTHORIZED TECHNICIAN SHOULD SOLVE THE PROBLEM. IF A WARNING OR ALARM PERSISTS TO OCCUR, CONSULT YOUR SUPPLIER. FREQUENTLY RESETTING THESE MESSAGES WITHOUT REMEDYING MAY DAMAGE THE UNIT.

WARNING

A warning level is a level below the shutdown level.

If one of the measurements exceeds the programmed warning level, a message will appear on the display and the general alarm LED will light up to warn the operator before the shutdown level is reached.

The message disappears as soon as the warning condition disappears.

SERVICE WARNING

If the service timer exceeds a programmed value, this will be indicated on the display to warn the operator to carry out the service actions.

IGNORING THIS SERVICE WARNING COULD SEVERELY DAMAGE YOUR MACHINE IN THE LONG TERM. THE SUPPLIER IS NOT LIABLE FOR FAILURES CAUSED BY NEGLECTING SERVICE INTERVAL TIMINGS.

AUTOMATIC RESTART AFTER VOLTAGE FAILURE (ARAVF)

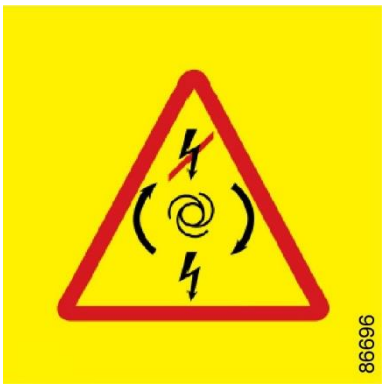
The machine is designed to not lead to hazardous situations after a power voltage failure (according to safety standards). However, if required, the ARAVF function can be activated in the Smartphone App (see section **Connectivity-Smartphone App**).

This function, when enabled, will automatically restart the unit when the voltage is restored after voltage failure. This function is deactivated in the unit before leaving the factory.

The activation of ARAVF function at customer side, will automatically release C.ARIA.C s.r.l. from any legal responsibility related to damages or injuries related to things and persons related to its activation and use. For this reason, due to the safety implications of this function it will be required that, before activating it, every responsible of the machine signs a declaration, which exempts C.ARIA.C s.r.l. from every liability. The danger is due to the fact that the machine is remote controlled and could start running without any notice. This could lead to eventual damage of the electrical plant and personal damage.

Please make sure to teach adequately, the personnel in charge of the unit start up, in order to be sure that before starting the unit, nobody is working close to the machine. And if maintenance is necessary that the proper Lock out, tag out (LOTO) procedure is followed.

IF THE FUNCTION IS ACTIVATED AND PROVIDED THE REGULATOR WAS IN THE AUTOMATIC OPERATION MODE, THE UNIT WILL AUTOMATICALLY RESTART IF THE SUPPLY VOLTAGE TO THE MODULE IS RESTORED. THE ARAVF LABEL SHALL BE ATTACHED NEAR TO THE CONTROLLER.



ARAVF label

The ARAVF label is attached on the side panel, next to the controller, with the goal of warning users of the risks linked to the function.

INTEGRATED CONNECTIVITY
Integrated connectivity allows you to monitor and control the unit by using just your smartphone. Use the application to check the real-time performance indicator like pressure, temperature, running hours and operation mode. Receive real time notification of warnings and shutdown.

Control the unit remotely with following functions:

- Start and stop the unit
- Set unload and load pressure
- Select your required pressure bands to enhance performance and save energy
- Set up your week timer

AS A FURTHER SAFEGUARD, PERSONS SWITCHING ON OR OFF REMOTELY CONTROLLED MACHINES SHALL TAKE ADEQUATE PRECAUTIONS TO ENSURE THAT THERE IS NO ONE CHECKING OR WORKING ON THE MACHINE. TO THIS END, A SUITABLE NOTICE SHALL BE AFFIXED TO THE START EQUIPMENT. SEE SECTION SERVICE MODE

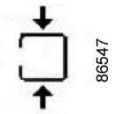
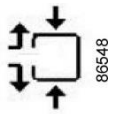
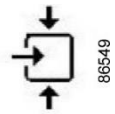
14.5.2 CONTROL PANEL

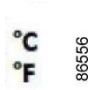
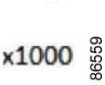
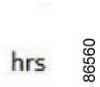
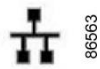
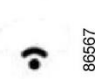
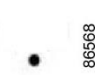
Fig. 17

Control panel

Reference	Designation	Function
1	Display	Shows the unit operating condition and a number of icons to navigate through the menu.
2	Warning sign	Flashes in case of a shutdown, is lit in case of a warning condition.
3	Service sign	Is lit when service is needed and flashing when the unit is in service mode.
4	Operation sign	Is lit when the unit is running in automatic operation.
5	Voltage sign	Indicates that the voltage is switched on.
6	Up button	Use these buttons to scroll through the menu.
7	Start/stop button	This button starts the unit. The operation sign (4) lights up. The controller is operative. This button also stops the unit at next pressing.
8	Down button	Use these buttons to scroll through the menu.
9	Enter button	Use this button to confirm the last action or reset the alarm.

14.5.3 ICONS USED ON THE DISPLAY STATUS ICONS

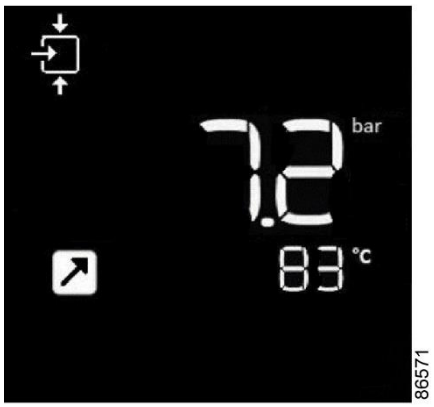
ICON	DESCRIPTION
 86547	Motor stopped
 86548	Running unloaded
 86549	Running loaded
 86550	Remote Machine Control Mode, active
 86551	Automatic Restart After Voltage Failure, active
 86552	Emergency stop
 86553	Main motor
 86554	Element outlet temperature
bar MPa psi 86555	Units of pressure, outlet

	Units of temperature, outlet
	Dryer
	Units of dryer LAT temperature (Low ambient temperature)
	Multiply value x1000
	Value in hours
	Value in seconds
	Fixed: Week timer, active Blinking: Waiting
	Fixed: LAN cable connected Blinking: LAN cable not connected
	Bluetooth connection
	Wi-Fi signal 100%
	Wi-Fi signal 75%
	Wi-Fi signal 50%
	Wi-Fi signal 25%
	Cloud connected
	Fixed: Over-the-air (OTA) update available Blinking: Over-the-air (OTA) update in progress

NOTE: This chapter gives a general survey of available icons. Not all icons mentioned in this chapter are applicable to every machine.

14.5.4 MAIN SCREEN

When the voltage is switched on, the first screen is a test screen. The next screen is the Main screen, shown automatically:



The Main screen shows:
- The unit status by means of pictographs
- The air outlet pressure
- The element outlet temperature

The screen backlight stays on for 2 minutes (default setting), to turn on the backlight again, press any key on the controller.

In case of warning or shutdown the backlight will light up automatically.
Remote Control Icon is always fixed even if remote controller is not activated.

14.5.5 WARNING

DESCRIPTION

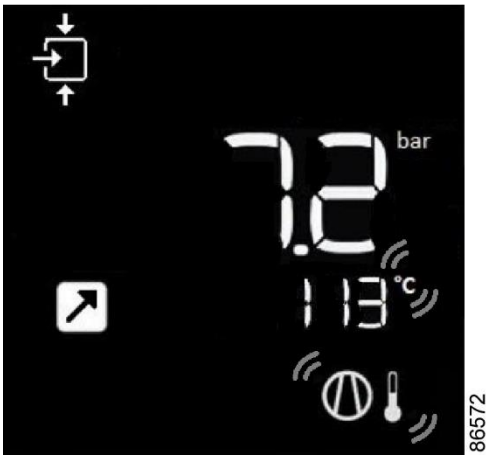
A Warning will appear in the event of:

- Too high temperature at the outlet of the compressor's element (TT11)
- Too low temperature at the outlet of the compressor's element (TT11)

If unit is connected to cloud, you will receive real time warning notification.

COMPRESSOR ELEMENT OUTLET TEMPERATURE (TT11)

If the outlet temperature of the compressor's element exceeds the warning level warning (factory setting 110°C / 230°F) LED (2) will light up:



Main screen with temperature outlet warning

The related pictograph

will appear flashing with temperature unit °C / °F icon. It remains possible to scroll through other screens, using the Scroll buttons up and down (6-8) to check the actual status of other parameters. Press button (7) to stop the compressor and wait until the compressor has stopped. Switch off the voltage, inspect the compressor and remedy. Before remedying, consult the **Safety precautions**. The warning message will disappear as soon as the warning condition disappears.

14.5.6 SHUTDOWN

DESCRIPTION

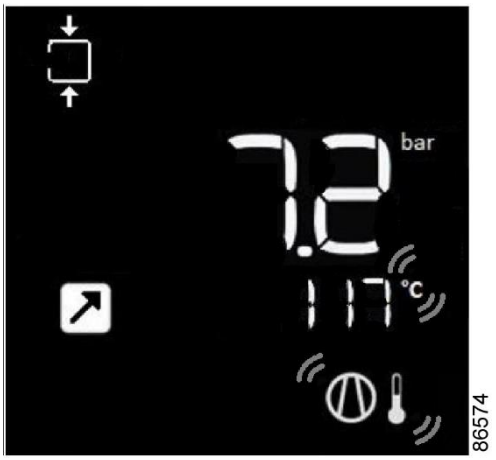
The unit will be shutdown in case of:

- Outlet temperature exceeds the shutdown level, detected by temperature sensor (TT11) or temperature switches (TSHH11-TSHH21)
- Error of the outlet pressure (PT20) /temperature sensor (TT11)
- Outlet pressure too high
- Frequency converter fault

If unit is connected to the cloud, you will receive real time shutdown notification.

COMPRESSOR ELEMENT OUTLET TEMPERATURE (TT11)

If the outlet temperature of the compressor element exceeds the shutdown level (factory setting 115 ˚C / 239 ˚F) the compressor will be shutdown, alarm LED (2) will flash, automatic operation LED (4) will go out and the following screen will appear:



Main screen with temperature outlet shutdown

The related pictograph

will appear flashing with temperature unit °C / °F icon.
Press Scroll buttons (6-8) until the actual compressor element temperature appears.
The screen shows that the temperature at the outlet of the compressor element is 117 ˚C.

- Switch off the voltage and remedy the trouble. Before remedying, consult the section **Safety precautions**.
- After remedying and when the shutdown condition has disappeared, switch on the voltage and restart the unit.

COMPRESSOR ELEMENT OUTLET TEMPERATURE BY TEMPERATURE SWITCH (TSHH11 / TSHH21)

If the outlet temperature of the compressor element triggers for temperature switch the compressor will be shutdown, alarm LED (2) will flash, automatic operation LED (4) will go out and the following screen will appear:

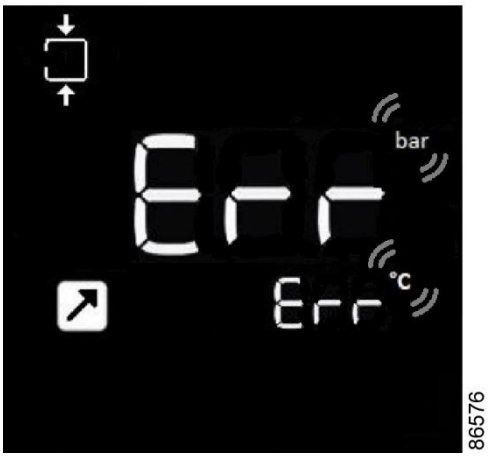
Main screen with temperature switch shutdown

The related pictograph

will appear flashing.

ERROR PRESSURE/TEMPERATURE SENSOR

In case of error of the outlet pressure sensor (PT20) or temperature sensor (TT11), compressor will be shutdown. The following screen will appear:



Error on pressure and temperature sensor

COMPRESSOR OUTLET PRESSURE TOO HIGH

If the outlet pressure of the compressor exceeds the shutdown level (factory setting 1.5bar / 22psi over the maximum pressure of compressor) the compressor will be shutdown, alarm LED (2) will flash, automatic operation LED (4) will go out and the following screen will appear:

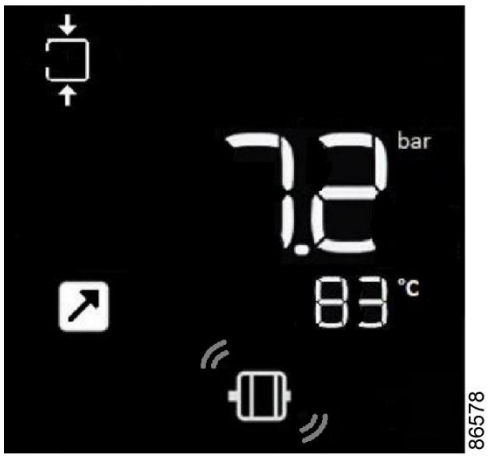
High outlet pressure

The unit of pressure bar/psi/MPa will appear flashing.

- Switch off the voltage and remedy the trouble. Before remedying, consult the section **Safety precautions**.
- After remedying and when the shutdown condition has disappeared, switch on the voltage and restart the unit.

FREQUENCY CONVERTER FAULT

In the event of frequency converter fault, the compressor will be shutdown, alarm LED (2) will flash, automatic operation LED (4) will go out and the following screen will appear:



Main screen with shutdown indication, Frequency converter fault

- Switch off the voltage and remedy the trouble. Before remedying, consult the **Safety precautions**.
- After remedying and when the shutdown condition has disappeared, switch on the voltage and restart the unit.

If FREQUENCY CONVERTER ALARM RESET does not work:
- Disconnect the unit from power supply for 15 minutes.
- After power supply is restored, **RESET** frequency converter alarm on controller.

If the problem is not solved, please contact the manufacturer's technical support.

Warnings and alarms

Frequency converter fault number	Controller alarm code	Fault text	Warning	Alarm	Trip locked	Cause of problem
2	2	Live zero error	X	X		Signal on terminal 53 is too low. Check control wiring
4	4	Line power ph. loss	X	X	X	Missing phase on supply side or too high voltage imbalance. Check supply voltage and connections.
7	80	DC over volt	X	X		Intermediate circuit voltage exceeds the limit. Check supply voltage.
8	100	DC under volt	X	X		Intermediate circuit voltage drops below the "voltage warning low" limit. Check supply voltage.
9	200	Inverter overload	X	X		More than 100% load for too long. Check current absorption and check for mech overload
10	400	Motor ETR over	X	X		Motor is too hot due to more than 100% load for too long.
11	800	Motor th over	X	X		The thermistor or the thermistor connection is disconnected. (Where thermistors are present)
13	1000	Overcurrent	X	X	X	Inverter peak current limit is exceeded. Check current absorption and check for mechanical overload and motor short-circuit.
14	4000	Ground Fault		X	X	Discharge from output phases to ground.
16	10000	Short-circuit		X	X	Short-circuit in the motor or on the motor terminals.
17	20000	Ctrl. word TO	X	X		No communication to the adjustable frequency drive.
24	1000000	Fan Fault	X	X		The fan is not working (Only on 400 V 40–1 25 hp [30–90 kW] units).
30	40000000	U phase loss		X	X	Motor phase U is missing. Check the phase.
31		V phase loss		X	X	Motor phase V is missing. Check the phase.
32		W phase loss		X	X	Motor phase W is missing. Check the phase.
38		Internal fault		X	X	Contact compressor service.
44		Ground Fault		X	X	Discharge from output phases to ground.
47		Control Voltage Fault	X	X	X	24 V DC may be overloaded.
48		VDD1 Supply Low		X	X	Control voltage low. Contact compressor service.
50		Calibration failed		X		Contact compressor service.
51		Unom,Inom		X		The setting of motor voltage, motor current and motor power is presumably wrong.
52		low Inom		X		The motor current is too low.
53		big motor		X		The motor is too big for the Automatic Motor Adaptation to be carried out
54		small mot		X		The motor is too small for the Automatic Motor Adaptation to be carried out
55		par. range		X		The parameter values found from the motor are outside acceptable range.
56		user interrupt		X		The Automatic Motor Adaptation has been interrupted by the user.
57		timeout		X		Try to start the AMA again a number of times. **NOTE!** **Repeated runs may heat the motor to a level where the resistance Rs and Rr are increased. In most cases, however, this is not critical.**

58		Internal	X	X		Contact compressor service
59		Current limit	X			The current is higher than the value in the Current Limit
60		External Interlock		X		External interlock has been activated. To resume normal operation, apply 24 V DC to the terminal programmed for external interlock and reset the adjustable frequency drive (via serial communication, digital I/O, or by pressing reset button on keypad).
66		Heat Sink Temperatur e Low	X			This warning is based on the temperature sensor in the IGBT module (Only on 400 V 40–1 25 hp [30–90 kW] units).
69		Pwr. Card Temp	X	X	X	The temperature sensor on the power card is either too hot and then clean the filter on the cubicle door, or too cold.
79		Illegal power section configuration	X	X		Internal fault. Contact compressor service
80		Drive initialized		X		All parameter settings are initialized to default settings.
87		Auto DC Braking	X			The drive is auto DC braking

14.5.7 SERVICE WARNING

A service warning will appear when the service timer has reached the programmed time interval. If the service timer exceeds the programmed time interval, alarm LED (3) will light up.

- Stop the unit, switch off the voltage and carry out the required service actions. See section 21

THE LONGER INTERVAL SERVICE ACTIONS MUST ALSO INCLUDE THE SHORTER INTERVAL ACTIONS. IN THE EXAMPLE ABOVE, CARRY OUT ALL SERVICE OPERATIONS BELONGING TO THE 8000 RUNNING HOURS INTERVAL AS WELL AS THOSE BELONGING TO THE 4000 RUNNING HOURS INTERVAL. THE SETTING OF THE SERVICE TIMER CAN BE CHANGED IN FUNCTION OF THE OPERATING CONDITIONS. SEE SECTION PREVENTIVE MAINTENANCE SCHEDULE

- After servicing, reset the service timer. See section **Calling up/resetting the service timer**.

14.5.8 REMOTE CONTROL

The unit can be commanded via external switches, this function is always activated. The unit can be commanded to start/stop via digital inputs.

NOTE: Have the modifications checked by your supplier. Stop the unit and switch off the voltage before connecting external equipment. Only potential-free contacts are allowed.

THE PERSONS SWITCHING ON REMOTELY CONTROLLED MACHINES SHALL TAKE ADEQUATE PRECAUTIONS TO ENSURE THAT THERE IS NO ONE CHECKING OR WORKING ON THE MACHINE. TO THIS END, A SUITABLE NOTICE SHALL BE AFFIXED TO THE REMOTE START EQUIPMENT.

14.5.9 SCROLLING THROUGH SCREENS

Scroll buttons (6-8) can be used to scroll through all screens. For most screens, the unit of measurement and the related pictograph are shown together with the screen number.

Example:

The screen shows the screen number **P.SEt,** the unit used **bar** and the related symbol for pressure unit.

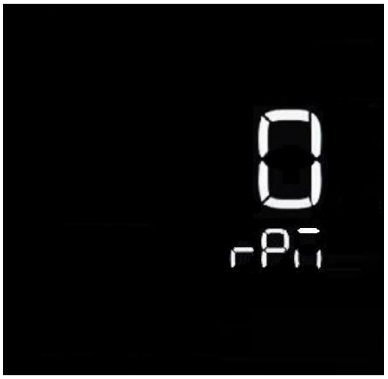
Press Enter key (9) to call up the actual running hours.

CONTROLLER SCREENS	DESIGNATION	FUNCTION
Main screen	Main with element outlet temperature	
Main screen	Main with rpm speed read from frequency converter	See section **Calling up main screen**
P.SEt	Pressure settings	See section **Calling up/ modifying pressure band settings**
HoUr	Running hours	See section **Calling-up running hours**
SoFt	Software relase version	See section **Calling Software release**
PAIr	Bluetooth pairing	See section **Calling-up Bluetooth pairing/ Discovery mode**

14.5.10 CALLING UP/ MODIFYING MAIN SCREEN

Starting from the Main screen:

- Press Scroll button (6-8) until **speed screen** is shown on the display:

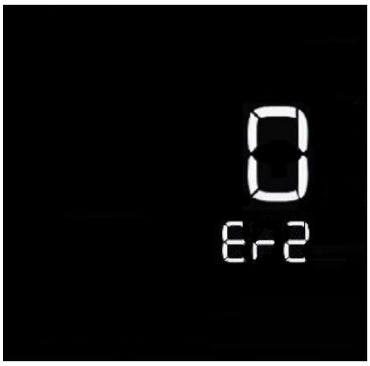


Speed rpm screen

- Press Enter button (9) to see converter fault code 1:

Er1 screen

- Press Scroll button (6-8) to see converter fault code 2:



Er2 screen

14.5.11 CALLING UP/ MODIFYING PRESSURE BAND SETTINGS

SETPOINT PRESSURE

Starting from the Main screen:

- Press Scroll button (6-8) until **P.SEt** is shown on the display.

Pressure setting screen

- Press Enter button (9) to modify.

Setpoint pressure changing

- Press again Enter button (9) to modify. The setpoint value starts blinking.
- Press Scroll button (6-8) to modify the setpoint pressure and press enter button (9) to confirm.

INDIRECT STOP LEVEL PRESSURE

Starting from the Main screen:

- Press Scroll button (6-8) until Indo is shown on the display.

Indirect stop level setting screen

- • Press Enter button (9) to modify.

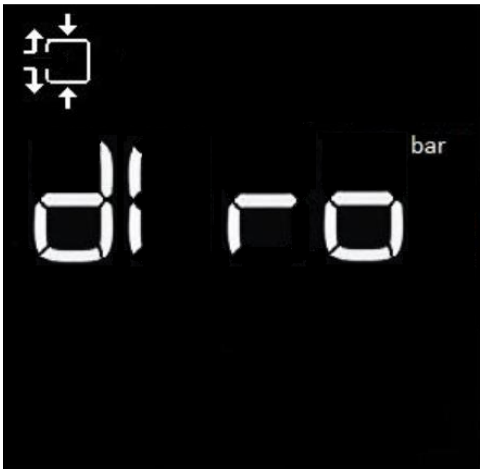
Indirect stop level pressure changing

- Press again Enter button (9) to modify. The indirect stop level value starts blinking.
- Press Scroll button (6-8) to modify the indirect stop level pressure and press enter button (9) to confirm.

DIRECT STOP LEVEL PRESSURE

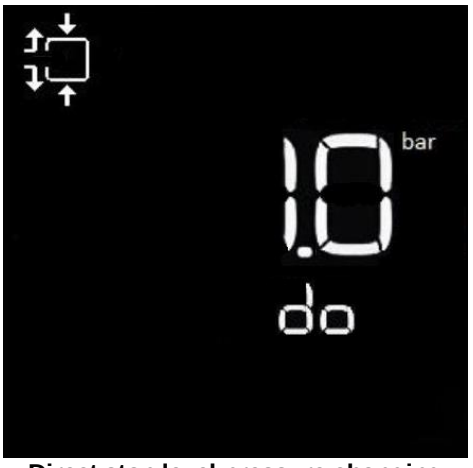
Starting from the Main screen:

- Press Scroll button (6-8) until **Diro** is shown on the display.



Direct stop level setting screen

- • Press Enter button (9) to modify.



Direct stop level pressure changing

- Press again Enter button (9) to modify. The direct stop level value starts blinking.
- Press Scroll button (6-8) to modify the direct stop level pressure and press enter button (9) to confirm.

14.5.12 CALLING UP RUNNING HOURS

Starting from the Main screen:

- Press Scroll button (6-8) until **HoUr** is shown on the display.

Running hours screen

- Press Enter button (9).

Running hours value

The screen shows the unit used (x1000 hrs) and the value (11.25): the running hours of the unit are 11250 hours.

14.5.13 CALLING UP SOFTWARE RELEASE

Starting from the Main screen:

- Press Scroll button (6-8) until **SoFt** is shown on the display.

Software release screen

- Press Enter button (9) to show the software release version.

14.5.14 CALLING UP BLUETOOTH PAIRING/ DISCOVERY MODE

For Bluetooth connectivity a paring with the device is necessary, see section **Connectivity**. This function is also a way to select the pair to the correct unit when multiple units are in the proximity. During the Bluetooth pairing, the controller generates and stores a random code. This code is displayed on the controller screen and the app user must enter this code in the app. The user enters this code to connect for the first time, after this the application allow automatic Bluetooth connection when the unit is in the range.

Starting from the Main screen:

- Press Scroll button (6-8) until **PAIr** is shown on the display.

Bluetooth pairing screen/ discovery mode

- Press Enter button (9) to show Bluetooth PIN code. Attention, PIN code is composed by 6 sliding numbers.
- To exit from pairing, press Enter button (9) again.

14.5.15 ADVANCED MENU

To enter inside the advanced menu Press buttons (6) and (8) together.

Advanced menu consists by following functions:

CONTROLLER SCREENS	DESIGNATION	FUNCTION
SEru	Service mode	See section **Calling-up Service mode**
tESt	Screen Test	See section **Calling-up Screen Test**
FACt	Factory reset	See section **Calling-up Factory reset**

14.5.16 SERVICE MODE

Service mode can be only enabled/disabled physically on the controller, this function will allow to notify the customer on the App that the service has been started on the machine and when it will be finished. It will also prevent remote start/stop when a service technician is working on a machine.

Once Service mode is active, it will not be possible to use any of the remote control functionalities like:

- Remote control with digital input
- Start/stop from application
- Timer Schedule
- Controller firmware over-the-air (OTA) updates

When service mode is active, the service icon (3) is blinking. The only available command during Service Mode is from start/stop button (7) to start the unit.

Starting from the Main screen:

- Press buttons (6) and (8) together to enter inside advanced menu
- **SEru** is shown on the display.
- Press enter button (9) to change status.
- Use scroll button (6-8) to set “on” or “off”.
- Use enter button (9) to confirm the status

14.5.17 SCREEN TEST

Starting from the Main screen:

- Press buttons (6) and (8) together to enter inside advanced menu.
- Press Scroll button (6-8) until **tESt** is shown on the display.
- Use enter button (9) to confirm the screen test.

The display now shows all icons that can be displayed:

Test screen

14.5.18 CALLING UP FACTORY RESET

This function restores the controller to original machine settings for pressure settings/units/starting. This parameter can only be modified after entering a password. Consult your supplier to use this function.

Starting from the Main screen:

- Press buttons (6) and (8) together to enter inside advanced menu
- Press Scroll button (6-8) until **FACt** is shown on the display.
- Press Scroll button (6-8) to enter a password.

14.5.19 CONNECTIVITY-SMARTPHONE APP

The controller has been designed as a standalone Internet of Things (IoT) solution. As such it includes integrated connectivity, which allows you to monitor and control your unit by using just your smartphone.

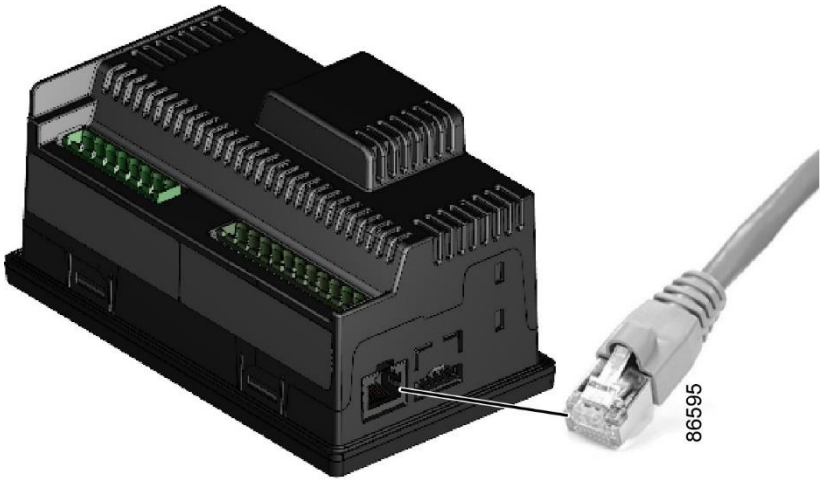
To enable this, you just need the ICONS application and an internet connection for your unit.

Download the ICONS application from the Play Store and App Store to get the full functionality of the unit.

In order to have an overview of all the features available in the App we refer to the APP guidelines document which can be found in the media section of the App.

Unit configuration and control are made possible by Bluetooth communication with digital signature. To connect the unit to the cloud for monitoring purposes, a Wi-Fi connection or alternatively an Ethernet network with access to Internet is required.

The network settings can also be changed after the Wizard, the change is only available with a Bluetooth connection. Wi-Fi 802.11 b/g/n 2.4Ghz connection supported. For the Ethernet, use a UTP cable (CAT 5e) to connect the controller, the position of RJ45 connector is in the bottom side of the controller inside the electrical cubicle.



Note: Have the modifications checked by your supplier. Stop the unit and switch off the voltage before connecting external equipment. Only potential-free contacts are allowed.

In the App you will be able to change the settings of "**Wi-Fi**" or "**Ethernet**", see App guidelines document.

When the unit is connected to the Wi-Fi network, the following icon

lights up on the controller. Otherwise for Ethernet, when the cable is plugged the following icon

lights up. If the internet is active and the unit is connected to the cloud, then the following icon is on.

Machine events and notification

The smartphone application sends real time push notifications in case of alarms or shutdown. This allows you to always be up to date on the status of the machine. In case you want more information, you can always press on the pop-up message in your Smartphone and you will redirected to the App.

Please look at the App guidelines document for a detailed explanation of this feature

OTA firmware update

Over-the-air (OTA) firmware updates are remote updates that do not require a direct connection to the unit. These are only possible if the controller of the machine is connected to the internet, so make sure to connect your machine to be able to use this feature. The benefits of this feature are to keep a product updated with the latest software to ensure optimal functionality, add the ability to receive new firmware to support additional features. Reduces time response to errors, bugs and security update without the need to physically service the unit.

When a firmware update is available, the following icon
appears on the unit's screen and a message is shown in your App

- Before starting the update, press the emergency stop button on the controller.
- Open your App tot start the update procedure.
- Follow the instructions in the application.
- At the start of the update the following icon on the controller screen starts blinking

DO NOT TURN THE POWER OFF THE UNIT DURING THE FIRMWARE UPDATE OR INTERRUPT THIS PROCEDURE. DURING THE UPDATE THE MACHINE WILL BE STOPPED; THE SCREEN AND LEDS WILL BE OFF.

- The firmware update loads the new firmware on your Compressor. This process can take a few minutes. Once the firmware update is complete, the controller will reboot.
- Reset the emergency stop alarm and manual start is required after the update.

Pressure settings

Changing pressure settings is one of the useful features only available in the App, when the smartphone is connected via Bluetooth to the unit.

Please look at the App guidelines document for a detailed explanation of this feature.

IF THE UNIT IS IN STANDBY AND THE LOADING PRESSURE IS SET ABOVE THE CURRENT PRESSURE SHOWN ON THE CONTROLLER, THE UNIT WILL START.

Timer schedule

With a timer schedule, you will not need to go every day to your unit to start and stop it. You will just need to specify a start and stop hour in the App. To active the function and set the timers you will need internet (Wi-fi or LAN) and a Bluetooth connection with the unit, this is needed to send the information from the phone to the controller. Then the information will be stored in the controller itself.

Please look at the App guidelines document for a detailed explanation of this feature.

When the Timer schedule is active, the related pictograph

will be shown on the controller display.

Main screen with timer schedule active

-

15.0 ORDINARY MAINTENANCE TO BE DONE BY THE USER

BEFORE CARRYING OUT ANY MAINTENANCE IT IS OBLIGATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER MAINS AND FROM THE COMPRESSED AIR DISTRIBUTION NETWORK.

The maintenance jobs described in this chapter may be carried out by the user.
The more complex maintenance jobs which require professionally skilled personnel are listed in the chapter on **GENERAL ROUTINE MAINTENANCE. (See Chap. 21.0)**

15.1 MAINTENANCE PROGRAMME

- ■ **OPERATIONS THAT MAY BE CARRIED OUT BY THE USER**
- ■■ **OPERATIONS THAT REQUIRE SKILLED PERSONNEL; THESE OPERATIONS ARE ILLUSTRATED IN PART "B" OF THIS MANUAL.**

The indicated oil exchange intervals are valid for standard operating conditions and nominal operating.
Exposure of the compressor to external pollutants or operation at high humidity combined with low duty cycles may require a shorter oil exchange interval. Contact your supplier if in doubt.

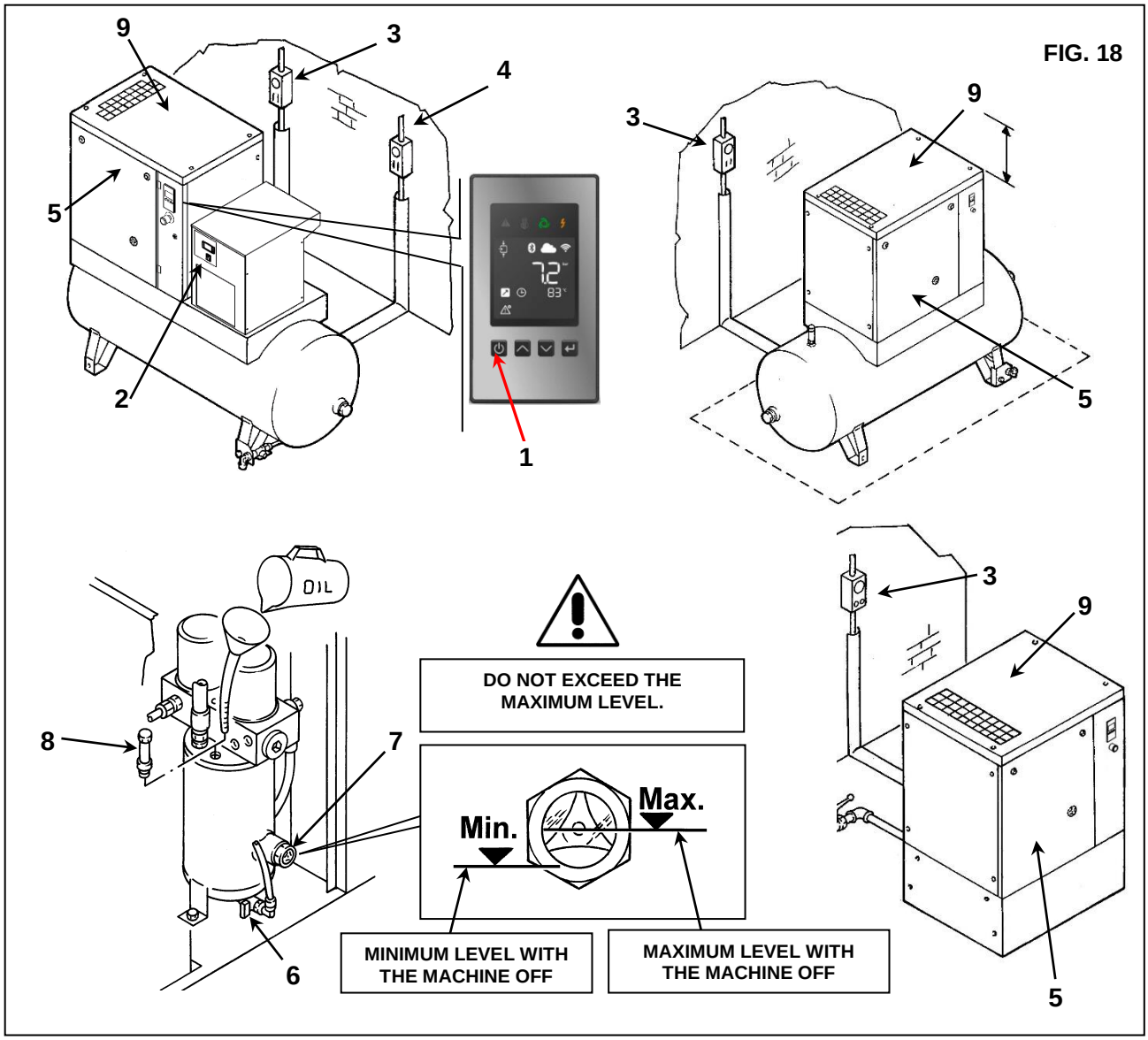
Every Day (after use)	■ Drain the condensate from the air tank ■ Check the automatic drainage of the condensate (dryer)
Every 50 working hours (or at least weekly)	■ Drain condensate from the oil tank ■ Check the oil level ■ Clean the filtering panels (black foam)
Every 500 hours (or at least every 3 months)	■ Clean the air suction filter ■ Clean the condenser unit (units equipped with dryer) ■ Clean the filter of the automatic condensate drain ■ Fixing electrical cables ■■ Check belt tension
Every 2000 hours (or at least every 1 year)	■ Change the suction filter ■■ Change the oil filter ■■ Check belt tension and adjust or change if necessary ■■ Replace the filter of automatic condensate drain ■■ Clean the finned surface of the air-oil cooler ■■ Safety valves: follow the applicable national legislation in force ■■ Retighten all power cable connections ■■ Inspect the air receiver wall thickness as per local legislation ■■ Change the oil
Every 4000 hours (or at least every 2 years)	■ Clean the finned surface of the air-oil cooler ■■ Change the filtering panels ■■ Change the oil separator filter ■■ Drain wear kit application (units equipped with dryer) ■■ Replace the belts
Every 6000 hours (or at least every 3 years)	■■ Service kit for the inlet valve. ■■ Service kit Thermostatic valve & MPV kit ■■ Check the status of the oil pipes (no cracks) ■■ Replace the non-return valve of the scavenge line

15.2 DRAINING CONDENSATE FROM THE OIL TANK (FIG.18)

If the compressor work cycle contemplates long pauses during which the machine cools down, a certain amount of condensate will gather in the oil tank. This happens, for example, when stopping overnight or at weekends.
The condensate must be drained off every 50 hours **or every week.** This operation may be performed only when the machine is cold, that is when it has been switched off for at least 8 hours.

BEFORE DRAINING THE CONDENSATE, IT IS OBLIGATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER MAINS.

Proceed as follows:
- Switch off the machine with pushbutton Ref. 1 Fig. 18.
- Press the button switch Rif. 2 Fig. 18 (on the dryer if fitted).
- Disconnect the power supply by means of the disconnector switch, Ref. 3 (on the screw-compressor) and Ref. 4 (on the dryer if fitted) Fig. 18.



- Wait for the machine to cool down.
- Remove the panel Ref. 5 Fig. 18 with the key provided.
- **SLOWLY turn on the tap Ref. 6 Fig. 18 and let the condensate flow out.**
- When the first traces of oil appear, turn off the tap.

CONDENSATE MUST BE DISPOSED OF IN CONFORMITY WITH THE LOCAL REGULATIONS IN FORCE.

- Check the oil level on the indicator Ref. 7 Fig. 18.
- If the oil level is under the minimum, top up as described at point **15.3**.

USE OIL OF THE SAME TYPE AS THAT ALREADY IN THE MACHINE; DO NOT MIX DIFFERENT TYPES OF OIL

15.3 CHECK OIL LEVEL AND TOP UP

- Switch off the machine with pushbutton Ref. 1 Fig. 18.
- Press the button switch Rif. 2 Fig. 18 (on the dryer if fitted).
- Disconnect the power supply by means of the disconnector switch, Ref. 3 (on the screw-compressor) and Ref. 4 (on the dryer if fitted) Fig. 18.
- **WAIT A FEW MINUTES FOR THE FOAM IN THE OIL COLLECTOR TO ABATE.**
- Check the oil level on the indicator Ref. 7 Fig. 18.
- If the oil level is below minimum, fill up as follows

USE OIL OF THE SAME TYPE AS THAT ALREADY IN THE MACHINE; DO NOT MIX DIFFERENT TYPES OF OIL.

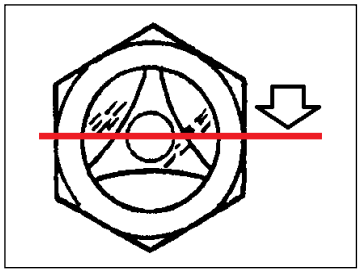
BEFORE CARRYING OUT ANY OPERATION ON THE MACHINE, ENSURE THAT THE ELECTRIC POWER SUPPLY HAS BEEN DISCONNECTED.

- Open the front protection Ref. 5 Fig. 18 using the special key.
- Remove the fixed protection device (machine cover) Ref. 9 Fig. 18.
- Slowly unscrew the oil cap Ref. 8 Fig 18, ensuring there is no pressure inside.
- Top up to maximum level Ref. 7 Fig. 18, with oil of the same type in the compressor.
- Close the oil manifold cap Ref. 8 Fig. 18.
- Close the fixed protection (machine cover) Ref. 9 Fig. 18 device again, using the appropriate safety screws.
- Close the front protection Ref. 5 Fig. 18.

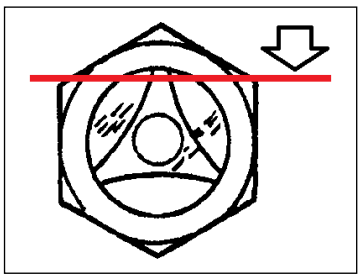
CHECK OIL LEVEL ONLY AFTER UNIT HAS RUN FOR AT LEAST 5 MINUTES.
DO NOT WAIT TOO LONG AFTER UNIT IS STOPPED, AND FOAM IS DISAPPEARED: OIL MAY MIGRATE

OIL LEVEL CHECK

Running unit:
- Foam level is in the center of sight glass.



Machine just stopped:
- When foam disappears, the sight glass must be almost completely filled with oil.

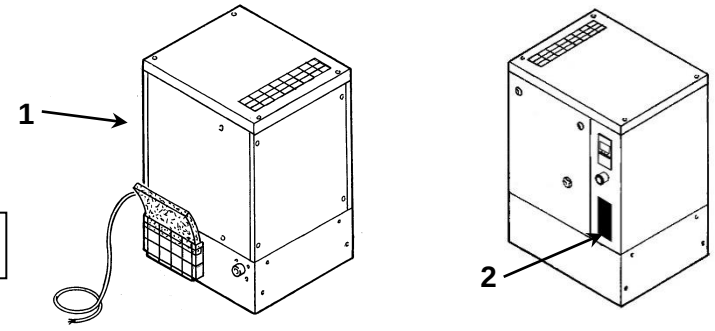


ATTENTION:
- Do not check level if machine is standing for more than 10 minutes.
- **Do not overfill.**

15.4 CLEANING\REMOVING THE FILTERING PANELS

- Stop the machine**.**
- Disconnect the power supply by means of the disconnector switch, Ref. 3 (on the screw-compressor) and Ref. 4 (on the dryer if fitted) Fig. 18.
- Clean\remove the filtering panel Rif. 1 Fig. 19 with a jet, of air wash it with water, **do not use solvents.**
- Clean\remove the filtering panel Rif. 2 Fig. 19 with a jet, of air wash it with water, **do not use solvents.**

FIG. 19



EVERY 50 WORKING HOURS CLEAN THE FILTERING PANELS.

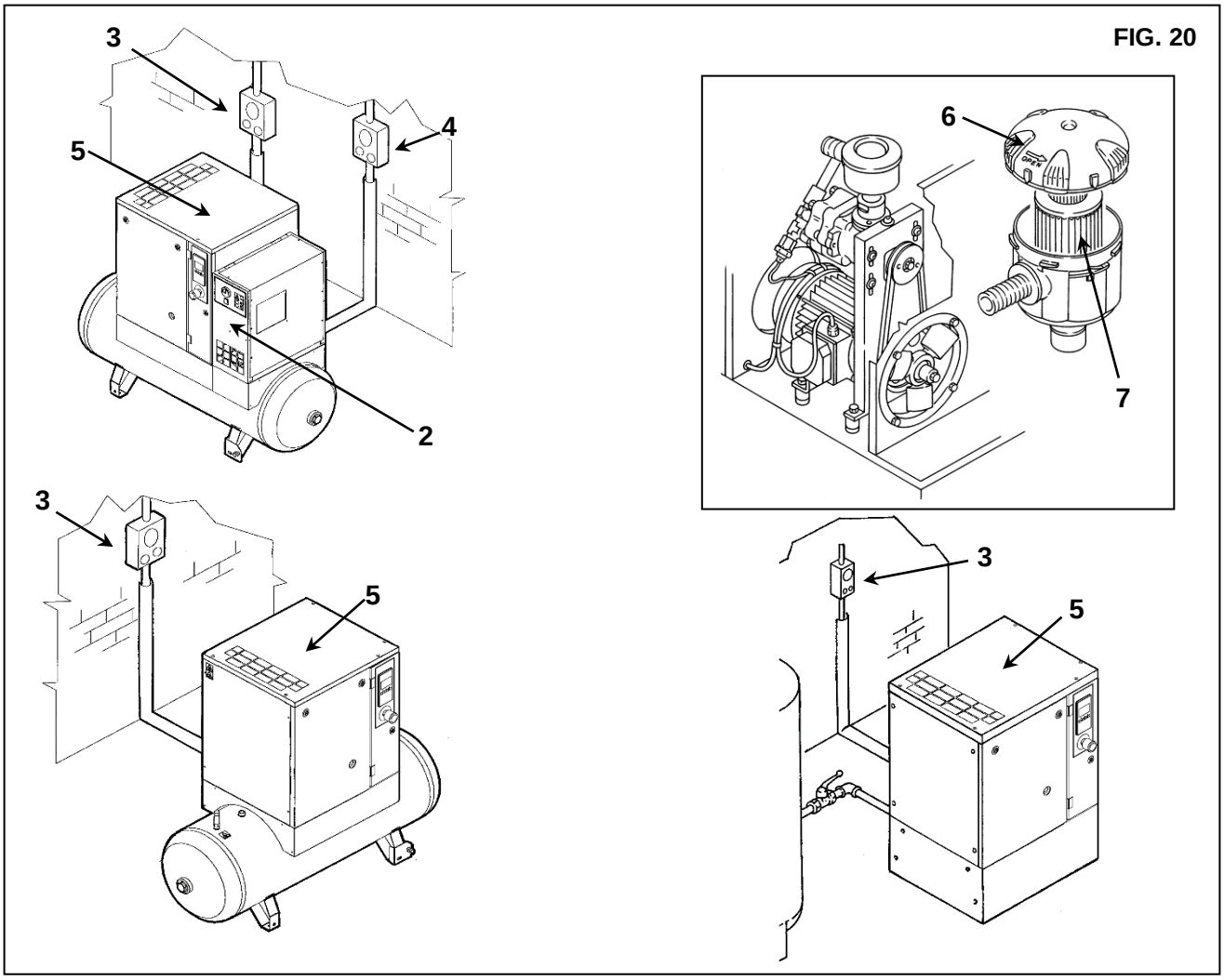
15.5 CLEANING THE SUCTION FILTER OR CHANGING THE FILTER (FIG.20)

- Stop the machine**.**
- Press the button switch Rif. 2 Fig. 20 (on the dryer if fitted)
- Disconnect the power supply by means of the disconnector switch, Ref. 3 (on the screw-compressor) and Ref. 4 (on the dryer if fitted) Fig. 20.

HOT PARTS INSIDE

- Remove the fixed protection device (machine cover) Ref. 5 Fig. 20.
- Remove the cover Ref. 6 Fig. 20 (Check the direction of the arrow).
- Remove the filter Ref. 7 Fig. 20.

FIG. 20



AVOID DROPPING FOREIGN BODIES INTO THE SUCTION MANIFOLD.

- Clean the filter with a jet of air, working from inside to outside, **DO NOT USE WATER OR SOLVENTS**. Alternatively, fit a new filter.
- Clean the disk on which the filter rests with a clean cloth.
- Fit the filter and the cover.
- If necessary, dispose of the old filter in conformity with the local regulations in force.
- Close the fixed protection device (machine cover) Ref. 5 Fig. 20 again, using the appropriate safety screws.

15.6 CHECK THE AUTOMATIC DRAINAGE OF THE CONDENSATE (DRYER) AND MANUAL DRAINAGE (AIR TANK) (FIG.21)

BEFORE CARRYING OUT ANY MAINTENANCE IT IS MANDATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER MAINS AND FROM THE COMPRESSED AIR DISTRIBUTION NETWORK.

The automatic and manual condensation drain (Rif. 8 and Ref. 11 Fig. 21) must be checked every day.
Proceed as follows:
- Press the "TEST" button, Ref. 8 Fig. 21, for a few seconds to check if the condensation is correctly drained from the pipe
- Check manual condensation draining from the tank, to ensure that condensation is correctly released from the valve, Ref. 11 Fig. 21 **(PURGE EVERY DAY)**.

15.7 CLEANING THE CONDENSER UNIT (FOR DRYER) (FIG.21)

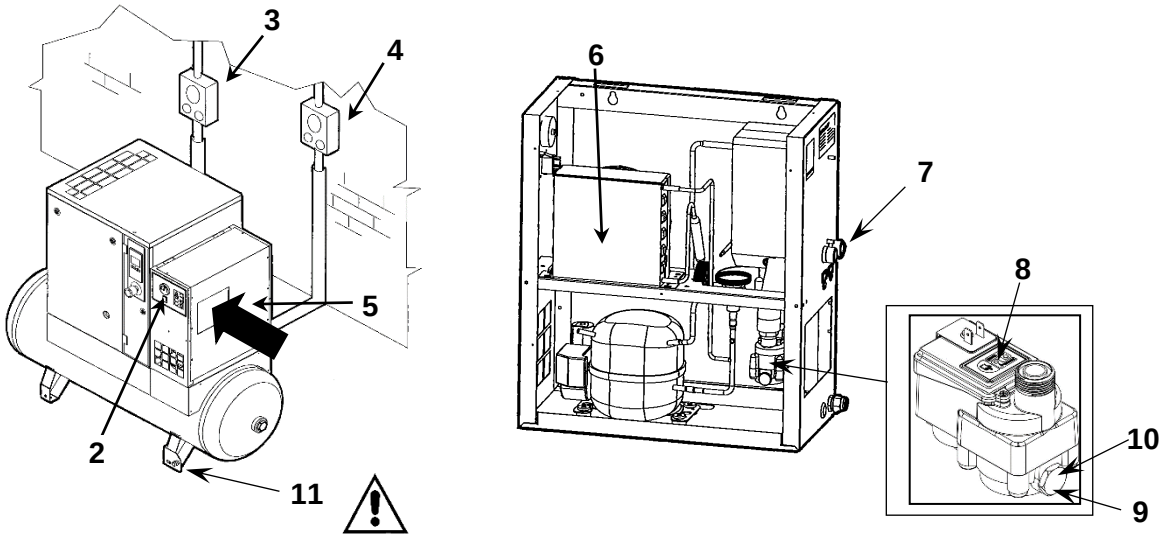
BEFORE CARRYING OUT ANY MAINTENANCE IT IS OBLIGATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER SUPPLY AND FROM THE COMPRESSED AIR DISTRIBUTION NETWORK.

The condenser must be cleaned every month (Ref. 6 Fig. 21).
Proceed as follows:
- Stop the compressor**.**
- Switch off the dryer by pressing the STOP button Ref. 2 Fig. 21
- Disconnect the power supply by means of the disconnector switch, Ref. 3 (on the screw-compressor) and Ref. 4 (on the dryer if fitted) Fig. 21.

HOT PARTS INSIDE

- Remove the cover panel Ref. 5 Fig. 21
- Clean the condenser fins Ref. 6 Fig. 21 with compressed air. **DO NOT USE WATER OR SOLVENTS.**
- Close the cover panel Ref. 5 Fig. 21.

FIG. 21



15.8 CLEAN THE FILTER OF THE AUTOMATIC DRAIN FOR DRYER (Ref. 9 - 10 Fig. 21)

BEFORE CARRYING OUT ANY MAINTENANCE IT IS OBLIGATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER SUPPLY AND FROM THE COMPRESSED AIR DISTRIBUTION NETWORK.

Proceed as follows:
- Close the air net valve Ref. 7 Fig. 21
- Stop the compressor**.**
- Switch off the dryer by pressing the STOP button Ref. 2 Fig. 21
- Disconnect the power supply by means of the disconnector switch, Ref. 3 (on the screw-compressor) and Ref. 4 (on the dryer if fitted) Fig. 21.
- Release the pressure from the dryer and tank by opening the drainage valve Ref. 11 Fig. 21.
- Remove the plug Ref. 9 Fig. 21.
- Take out the filter trap Ref. 10 Fig. 21.

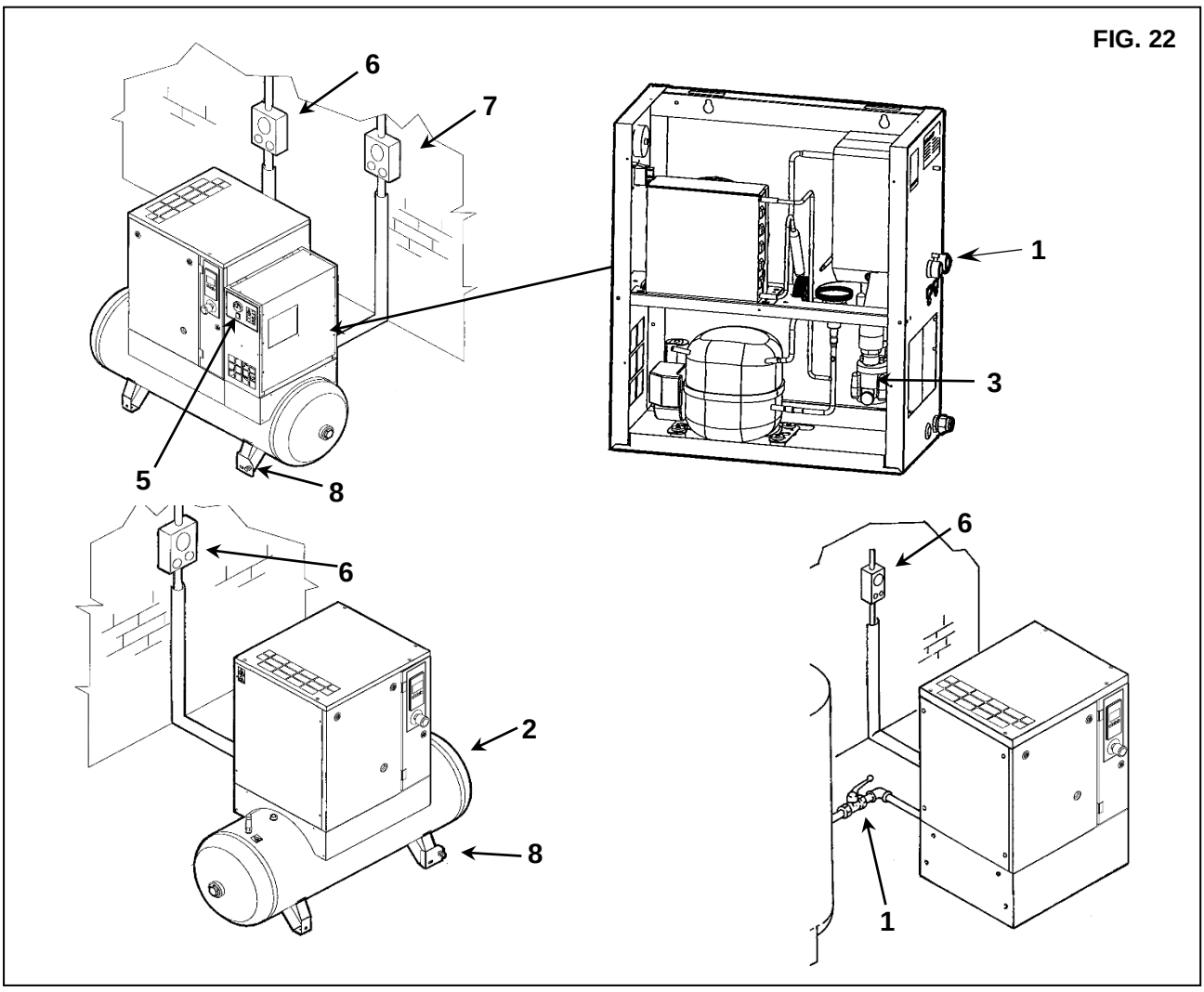
- Clean the filter Ref. 10 Fig. 21 with a jet of air, blowing from inside to outside.
- Install the filter and the plug.

16.0 PERIODS OF INACTIVITY (FIG. 22)

If it's required that the machine stays inactive for a long period (above one week):
- Run machine 30 minutes at full load to purge the machine from condensate.
- Stop the machine**.**
- Close the valve Ref. 1 and Ref. 2 Fig. 22.
- Press the button switch Ref. 5 Fig. 22 (if unit with dryer)
- Disconnect the power supply by means of the disconnector switch, Ref. 6 (on the screw-compressor) and Ref. 7 (on the dryer if fitted) Fig. 22.
- Release the pressure from the dryer and air tank by opening the drain outlet valve Ref. 8 Fig. 22.
- Close the valve Ref. 8 Fig. 22 after the residual pressure in the unit is all released.
- One day after stop, there may be some condensate in the bottom of the oil tank. Drain this condensate.

During periods of inactivity, the unit must be protected against atmospheric agents, dust and humidity which could damage the motor and the electrical system.
For stops above 2 weeks it's recommended to install VCI foam in the cubicle and canopy.
To restart the machine after periods of inactivity above 3 months, consult the manufacturer.

FIG. 22



17.0 SCRAPPING THE UNIT

If the machine is to be scrapped, it must be dismantled into parts of the same material, to be disposed of according to the local regulations in force.

ALWAYS RESPECT THE LOCAL REGULATIONS FOR DISPOSING OF OLD OIL AND OTHER POLLUTING MATERIALS SUCH AS SOUND-ABSORBING, INSULATING FOAM, ETC.

18.0 Service kits

For overhauling and for preventive maintenance, a wide range of service kits is available. Service kits comprise all parts required for servicing the component and offer the benefits of genuine parts while keeping the maintenance budget low.
Also a full range of extensively tested lubricants, suitable for your specific needs is available to keep the compressor in excellent condition.
Consult the Spare Parts List for part numbers.

19.0 TROUBLE-SHOOTING AND EMERGENCY REMEDIES

N.B. OPERATIONS MARKED ■ ■ MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL AUTHORISED BY THE MANUFACTURER

ALL WORK MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL. BEFORE CARRYNG OUT ANY MAINTENANCE JOBS IT IS MANDATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER SUPPLY.

19.1 TROUBLE-SHOOTING AND EMERGENCY REMEDIES FOR SCREW COMPRESSOR

FAULT FOUND	POSSIBLE CAUSES	OBSERVATIONS
1) The machine does not start	**1A** - no power **1B** - the transformer protection fuse is interrupted	- check the power supply line, Chapter 12.2 - replace fuse with new one of same size.
2) The machine does not start The red LED (Ref. 2 Fig. 17) is flashes. The following pictograph appears intermittently: 	**2A** - The converter fault is triggered **2B** – Temperature switch on element outlet has tripped	- See converter table alarms in section “Shutdown” - environment temperature too high; improve ventilation in the compressor room, Chapter 9.2 ■ ■ - cooling radiator is dirty, clean the radiator - oil level too low; top up the oil tank
3) The machine does not start The red LED (Ref. 2 Fig. 17) is flashes. The following pictograph appears intermittently: 	**3A** - The oil high temperature protection has tripped	- environment temperature too high; improve ventilation in the compressor room, Chapter 9.2 ■ ■ - cooling radiator is dirty, clean the radiator - oil level too low; top up the oil tank
4) The compressor does not reach working pressure	**4A** - the compressed air consumption is too high **4B** - the discharge electrovalve remains open, Ref. EV/SC wiring diagram	■ ■ - check the electric system
5) Excess oil consumption	**5A** - deteriorated oil separating filter or oil level is too high	■ ■ - change the oil separating filter, Chapter 23

19.2 TROUBLE-SHOOTING AND EMERGENCY REMEDIES FOR DRYER

ALL WORK MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL. BEFORE CARRYNG OUT ANY MAINTENANCE JOBS IT IS MANDATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER SUPPLY.

N.B. OPERATIONS MARKED ■ ■ MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL AUTHORISED BY THE MANUFACTURER

FAULT FOUND	POSSIBLE CAUSES	OBSERVATIONS
1) No compressed air passes through the dryer outlet	**1A)** The pipes are frozen inside	■■ -The bypass valve of the hot gas is broken or out-of-calibration -The room temperature is too low and the evaporators piping are obstructed with ice
2) Presence of condensate in the pipings.	**2A)** The condensate separator does not work correctly **2B)** The dryer is working outside its rating **2C)** The dryer is working under bad conditions of condensation	■■ -Check the solenoid exhaust valve ■■ -Check the drainage timer -Check the flow rate of treated air -Check the room temperature -Check the air temperature at the drier inlet. -Clean the condenser. ■■ -Check the good operation of the fan.
3) The compressor head is very hot (> 55 °C)	Make reference to **2B** Make reference to **2C** **3A)** The cooling circuit is not working with the right gas charge	■■ -Check if there are leaks of refrigerating gas. ■■ - Charge it again.
4) Motor cuts out on overload	Make reference to **2B** Make reference to **2C** Make reference to **3A**	
5) The motor hums and does not start.	The line voltage is too low. You switched the machine off and on again without leaving enough time for the pressure balancing. The starting system of the motor is defective.	-Contact the electric power company -Wait a few minutes before starting the machine again. ■■ -Check the running and starting relays and condensers (if any)
6) The compressor is very noisy.	Troubles with the internal mechanical parts or with the valves	

PART “B”

THIS PART "B" OF THE INSTRUCTIONS MANUAL IS RESERVED FOR PROFESSIONALLY SKILLED PERSONNEL AUTHORISED BY THE MANUFACTURER.

IVR MODELS: THE CAPACITORS INSIDE THE INVERTER MAY REMAIN LIVE FOR 15 MINUTES (VARIABLE SPEED) AFTER THE MACHINE HAS BEEN DISCONNECTED FROM THE MAINS POWER.
WAIT AT LEAST 15 MINUTES (VARIABLE SPEED) AFTER ISOLATING THE SUPPLY VOLTAGE BEFORE PERFORMING SERVICING OPERATIONS OR REPAIRS TO AVOID THE RISK OF DEATH OR SERIOUS INJURY.

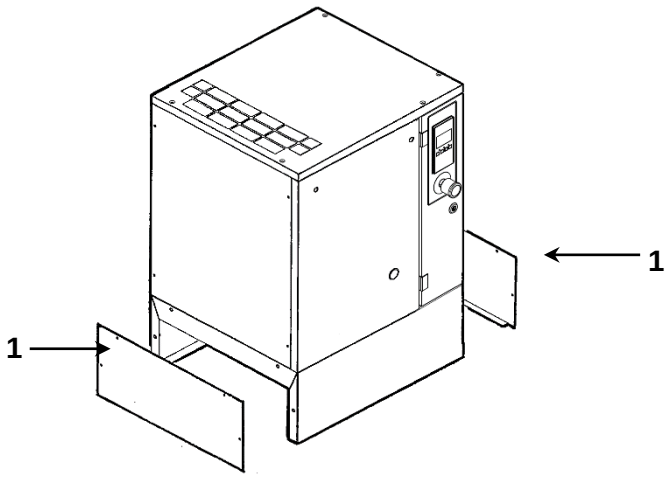
20.0 STARTING UP

BEFORE CARRYING OUT ANY OPERATION ON THE MACHINE, ENSURE THAT THE ELECTRIC POWER SUPPLY HAS BEEN DISCONNECTED.

20.1 PREPARING FOR SETTING UP (FIG.23)

After checking everything as indicated in Chap. 12, folow the instructions in Fig. 23.
- Fit the sound-absorbing panels Ref. 1 Fig. 23
- These parts are packed in the bodywork.

FIG. 23



20.2 PRELIMINARY CHECKS

Check the oil level Ref. 1 Fig. 24; when delivered, the machine is filled with oil, if the oil level is not as intended, top up with the same oil as the original type (use the procedure in the chapter 15.3).
If more than 3 months have passed between the inspection in the factory and the date of installation, lubricate the screw group before starting up, following the procedure described below:
- Remove the protection Ref. 2 Fig. 24
- Remove the fixed protection device (machine cover) Ref. 3 Fig. 24.
- Remove the cover Ref. 4 Fig. 24
- Remove the air filter Ref. 5 Fig. 24
- Pour a little oil into the suction unit.
- Reassemble the air filter Ref. 5 Fig. 24
- Reassemble the cover Ref. 4 Fig. 24

If more than 6 months have passed between the inspection in the factory and the date of installation, consult the manufacturer.

20.3 STARTING THE DRYER (FIG.24)

Start the dryer before turning on the compressed air.
The compressed air piping will be free of condensate only by doing so.
The dryer must be kept running during all the time the air compressor is running. **WARNING:** if the dryer is switched off, before starting it again, wait at least 5 minutes in order to allow the pressure balancing.

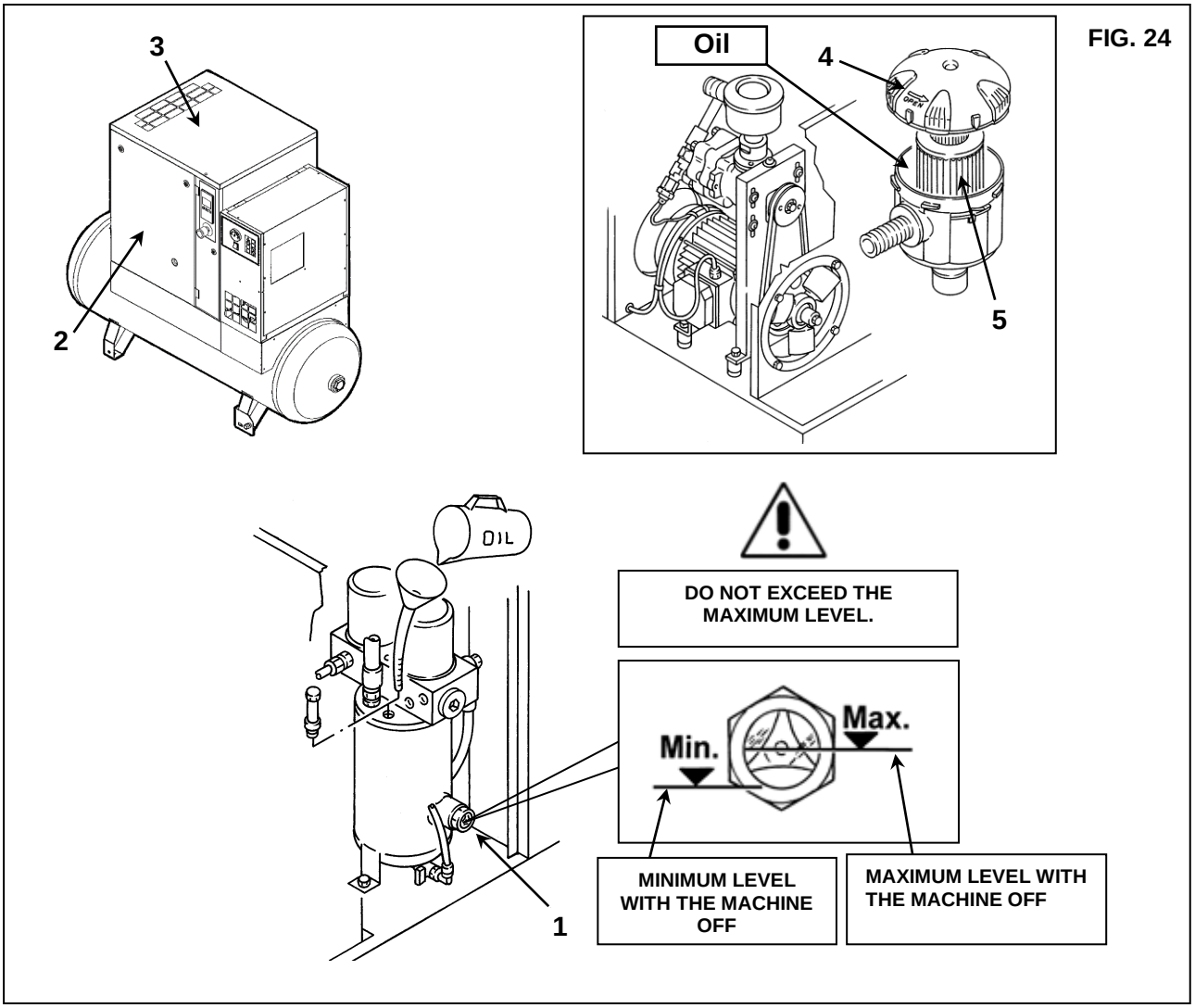


FIG. 24

20.4 CHECK THE COMPRESSOR ROTATION DIRECTION AND START UP (FIG.25)

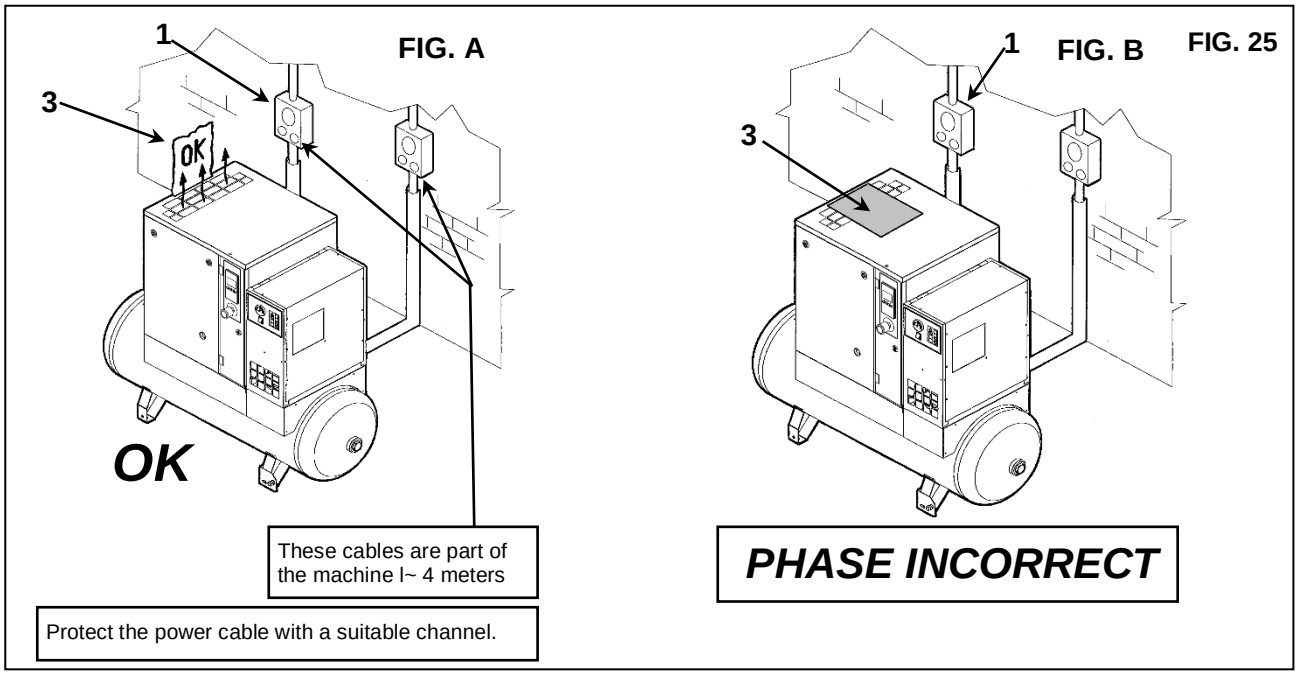
- Check that all the protective shields are in place.
- Apply voltage to the control panel by operating the disconnector switch of the line Ref. 1 Fig. 25.
- Switch on the compressor pressing start/stop button. Immediately after 1s, stop the compressor acting on the stop button.
- **If the rotation is correct, the paper sheet Ref. 3 is blown up (See Fig. A)**
- **If the rotation is not correct, the paper sheet remains flat (See Fig. B) PHASE INCORRECT**

ALL WORK ON THE ELECTRIC PLANT, HOWEVER SLIGHT, MUST BE CARRIED OUT BY PROFESSIONALLY SKILLED PERSONNEL.

- Disconnect the power supply and contact the supplier.

IT IS ADVISABLE NOT TO DO ANYTHING ON THE MACHINE PANEL.

IF ALL THE INSTRUCTIONS FOUND IN THIS MANUAL HAVE BEEN OBSERVED THE MACHINE CAN BE STARTED.



21.0 GENERAL ORDINARY MAINTENANCE REQUIRES TRAINED PERSONNEL

BEFORE CARRYING OUT ANY MAINTENANCE JOBS IT IS OBLIGATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER MAINS.

MAINTENANCE SCHEDULE

- ■ **OPERATIONS THAT MAY BE CARRIED OUT BY THE USER**
- ■■ **OPERATIONS THAT REQUIRE SKILLED PERSONNEL; THESE OPERATIONS ARE ILLUSTRATED IN PART "B" OF THIS MANUAL.**

The indicated oil exchange intervals are valid for standard operating conditions and nominal operating.
Exposure of the compressor to external pollutants or operation at high humidity combined with low duty cycles may require a shorter oil exchange interval. Contact your supplier if in doubt.

Every Day (after use)	■ Drain the condensate from the air tank ■ Check the automatic drainage of the condensate (dryer)
Every 50 working hours (or at least weekly)	■ Drain condensate from the oil tank ■ Check the oil level ■ Clean the filtering panels (black foam)
Every 500 hours (or at least every 3 months)	■ Clean the air suction filter ■ Clean the condenser unit (units equipped with dryer) ■ Clean the filter of the automatic condensate drain ■ Fixing electrical cables ■■ Check belt tension
Every 2000 hours (or at least every 1 year)	■ Change the suction filter ■■ Change the oil filter ■■ Check belt tension and adjust or change if necessary ■■ Replace the filter of automatic condensate drain ■■ Clean the finned surface of the air-oil cooler ■■ Safety valves: follow the applicable national legislation in force ■■ Retighten all power cable connections ■■ Inspect the air receiver wall tickness as per local legislation ■■ Change the oil
Every 4000 hours (or at least every 2 years)	■ Clean the finned surface of the air-oil cooler ■■ Change the filtering panels ■■ Change the oil separator filter ■■ Drain wear kit application (units equipped with dryer) ■■ Replace the belts
Every 6000 hours (or at least every 3 years)	■■ Service kit for the inlet valve. ■■ Service kit Thermostatic valve & MPV kit ■■ Checking the status of the oil pipes (no cracks) ■■ Replace the non-return valve of the scavenge line

22.0 CHANGING THE OIL (FIG. 26)

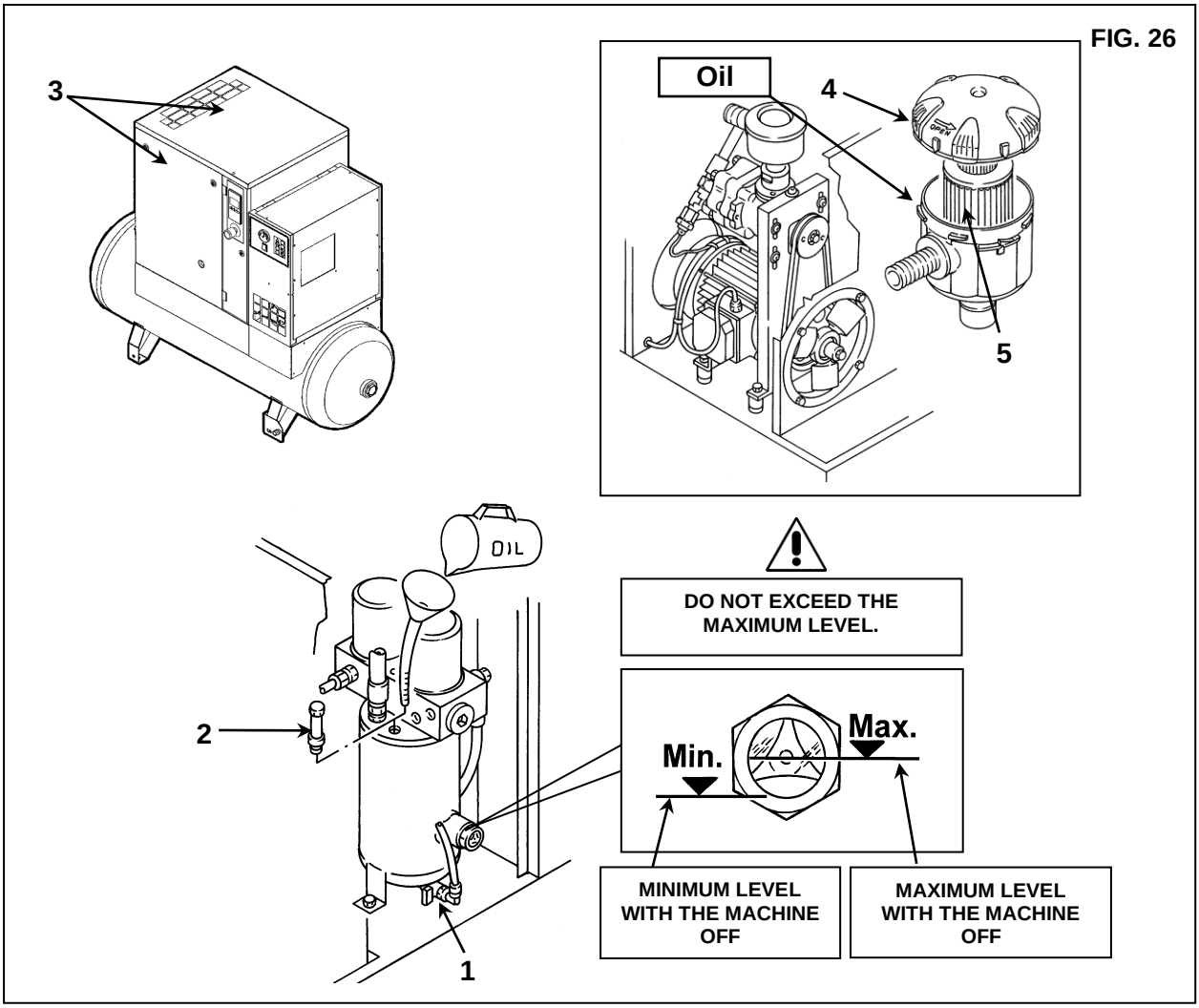
CAUTION: THIS OPERATION MUST BE DONE TOGETHER WITH THE OIL FILTER AND AIR FILTER EXCHANGE

BEFORE CARRYING OUT ANY MAINTENANCE JOBS IT IS OBLIGATORY TO STOP THE MACHINE AND DISCONNECT IT FROM THE POWER MAINS AND FROM THE COMPRESSED AIR DISTRIBUTION NETWORK.

Oil changing is an important operation for the compressor: if the lubrication of the bearings is not efficient, the compressor life will be short.
The oil must be changed when the machine is still warm, that is immediately after stopping it.
The suggestions listed below should be scrupulously followed.
After draining the old oil out of the machine Ref. 1 Fig. 26.
- Fill the oil manifold Ref. 2 Fig. 26 up to the level mark
- Pour a drop of oil into the intake unit, as described in CHAP. 20.1
- Close all the protections (cover and front protection) Ref. 3 Fig. 26
- Start the compressor**.**
- After about 1 minute, stop the machine**.**

PROCEED AS DESCRIBED AT CHAPTER 15.3

FIG. 26



THE OLD OIL MUST BE DISPOSED OF IN COMPLIANCE WITH THE REGULATIONS IN FORCE.

NOTE ON LUBRICANTS
When delivered the machine is filled with oil.
In normal conditions of use, these lubricants have proved to be able to withstand use for as many as 4.000 hours. However, due to the external polluting agents that get into the compressor with the air that it takes in, it is advisable to change the oil at more frequent intervals, as indicated on the routine maintenance chart.
If the compressor is being used at high temperatures (continuous operation above 90 °C) or in particularly severe conditions, we advise changing the oil at shorter intervals than those recommended in the maintenance chart.

DO NOT TOP UP WITH DIFFERENT OILS

23.0 REPLACE THE OIL SEPARATOR FILTER AND THE OIL FILTER (FIG. 27)

BEFORE CARRYING OUT ANY MAINTENANCE THE MACHINE MUST BE STOPPED, CUT OFF THE MACHINE FROM THE ELECTRICAL MAINS AND FROM THE COMPRESSED AIR DISTRIBUTION CIRCUIT, CHECK THAT THE MACHINE IS NOT UNDER PRESSURE.

N.B. INTERNAL PRESSURE IS AUTOMATICALLY DISCHARGED AFTER ABOUT 30 SECONDS WHEN THE MACHINE IS TURNED OFF

Proceed as follows:
- Open the front panel Ref. 1 Fig. 27 with the special key.
- Remove the fixed protection device (machine cover) Ref. 2 Fig. 27.
- Remove the oil separation filter Ref. 3 and oil filter Ref. 4 Fig. 27.
- Lubricate the filter seals with a little oil before fitting.
- Tightening must be done by hand.
- Close the fixed protection (machine cover) Ref. 2 Fig. 27 device again, using the appropriate safety screws.
- Close the panel Ref. 1 Fig. 27.

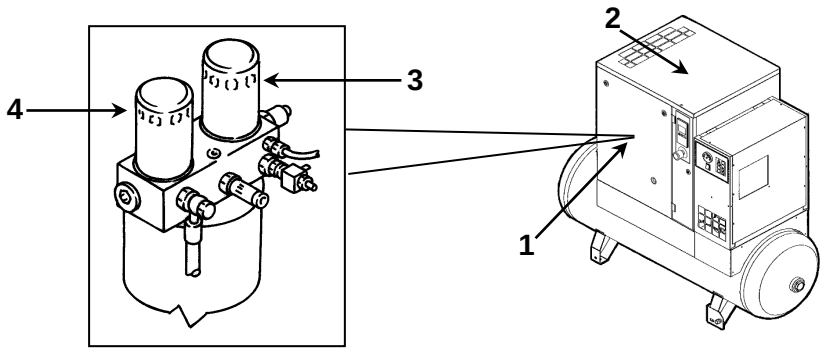


FIG. 27

24.0 BELT TENSION (HP 3-4-5,5-7,5-10 / kW 2,2-3-4-5,5-7,5) (FIG. 28)

BEFORE CARRYING OUT ANY MAINTENANCE THE MACHINE MUST BE STOPPED, CUT OFF THE MACHINE FROM THE ELECTRICAL MAINS AND FROM THE COMPRESSED AIR DISTRIBUTION CIRCUIT, CHECK THAT THE MACHINE IS NOT UNDER PRESSURE.

Tightening or retightening new belts
Proceed as follows:
- Open the front panel Ref. 1 Fig. 28 with the special key.
- Remove the fixeds protections device Ref. 2, 3, 4 Fig. 28.
- Loose the screws by half a turn Ref. 5 Fig. 28.
- Adjust the belt tension by turning the screws Ref. 6 Fig. 28
- Close the screws again Ref. 5 (✱✱) Fig. 28.
- The belt tensioning values are indicated with a label on the element-motor frame. The force and deflection varies with the power of the unit, and with the total running hours of the belt.
- Close the fixeds protections Ref. 2, 3, 4 Fig. 28 device again, using the appropriate safety screws.
- Close the panel Ref. 1 Fig. 28.

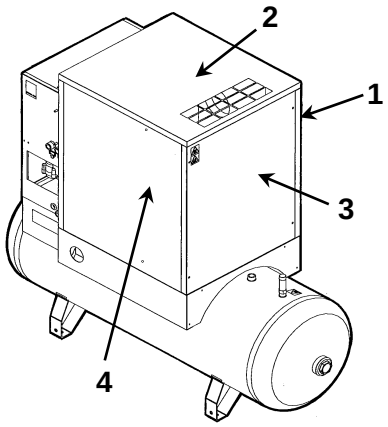
25.0 REPLACING THE BELT (HP 3-4-5,5-7,5-10 / kW 2,2-3-4-5,5-7,5) (FIG. 28)

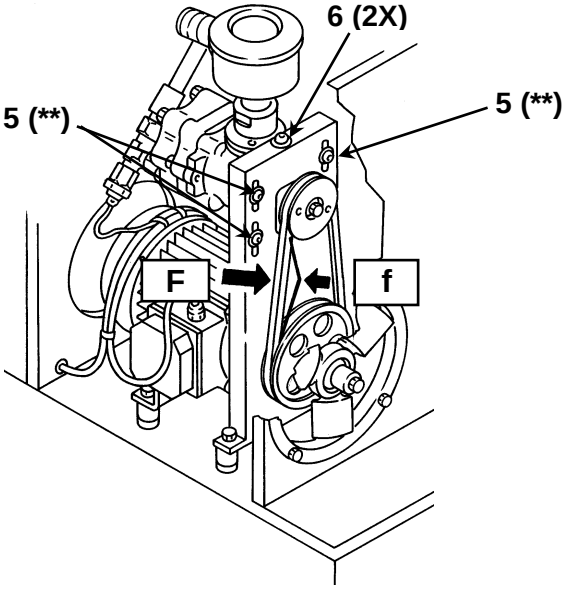
BEFORE CARRYING OUT ANY MAINTENANCE THE MACHINE MUST BE STOPPED, CUT OFF THE MACHINE FROM THE ELECTRICAL MAINS AND FROM THE COMPRESSED AIR DISTRIBUTION CIRCUIT, CHECK THAT THE MACHINE IS NOT UNDER PRESSURE.

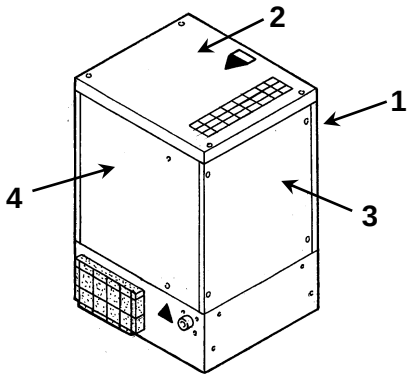
Proceed as follows:
- Open the front panel Ref. 1 Fig. 28 with the special key.
- Remove the fixeds protections device Ref. 2, 3, 4 Fig. 28.
- Remove the internal support oil cooler (n°3 screws M6).
- Loose the screws by half a turn Ref. 5 Fig. 28.
- Release belt tension by unscrewing the screw Ref. 6 (2X) Fig. 28.
- Dismantle and remove the belt Ref. 9 Fig. 28 and fit the new belt following the instructions in reverse order.
- **To set belt tension, proceed as given in Chap. 24.0.**
- Reassemble the internal support oil cooler (n°3 screws M6).
- Reassemble the permanent protections Ref. 2, 3, 4 Fig. 28 fixing them in place with the special safety screws
- Close the panel Ref. 1 Fig. 28.

HP 3-4-5,5-7,5-10 / kW 2,2-3-4-5,5-7,5

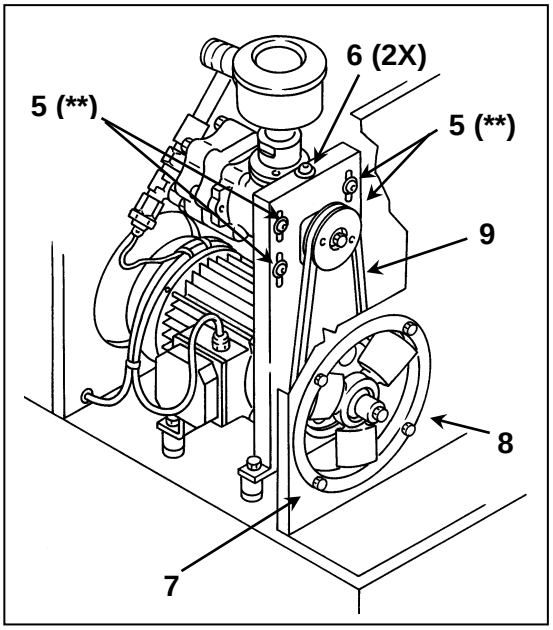
FIG. 28

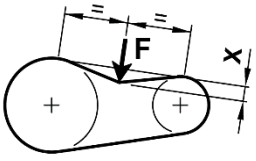






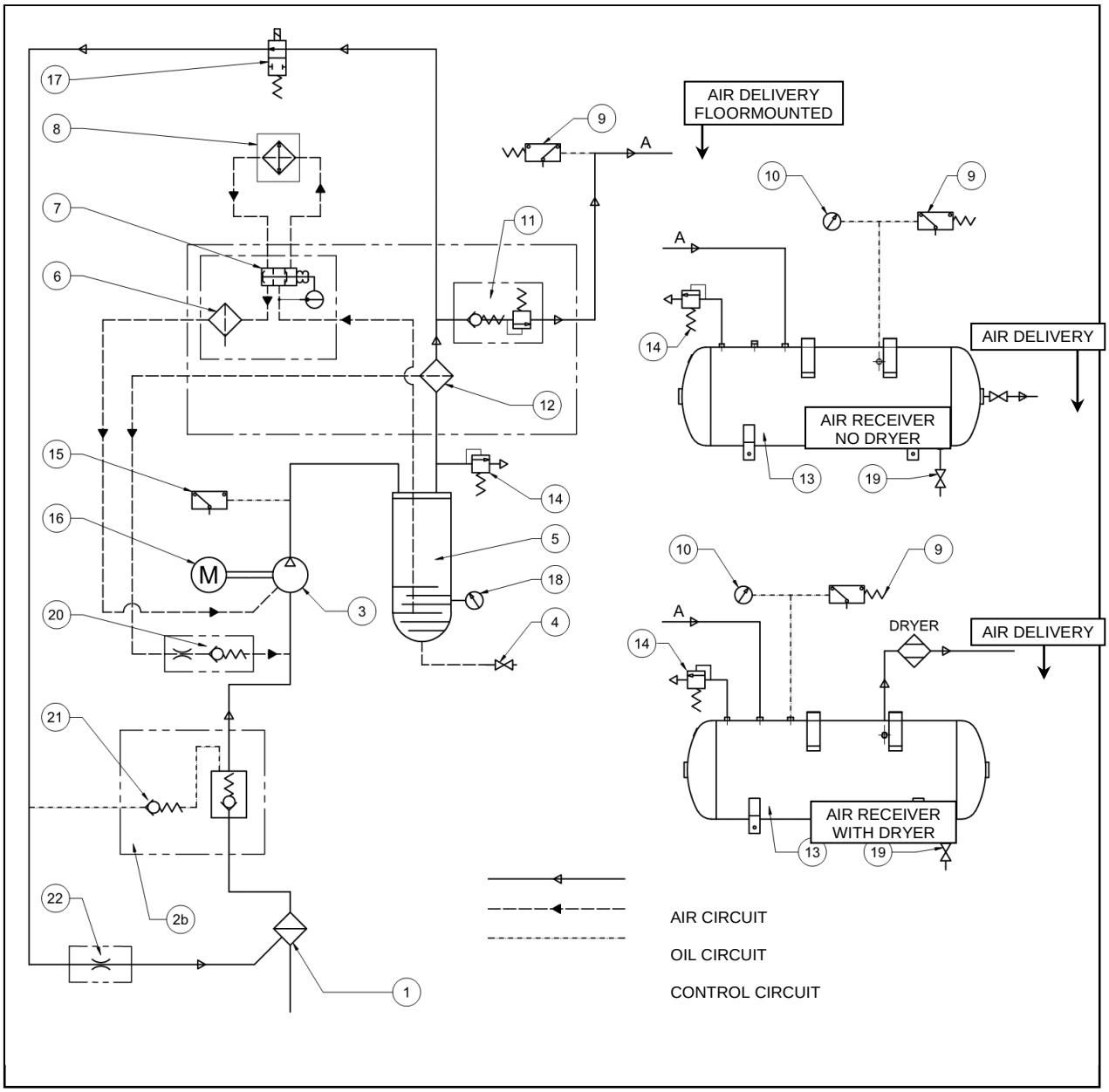
(**) Tightening torque = **25 N•m**





POWER kW (hp)	F(force) (N)	(lbf)	NEW BELT(S) Xdeflection mm (in)	freq. (Hz)	USED BELT(S) Xdeflection mm (in)	freq. (Hz)
2,2-3-4-5,5 (3-4-5,5-7,5)	50	11	7 (0,27")	120-125	8 (0,31")	100-105
7,5 (10)	25	5,5	5,4 (0.21")	115-120	6,1 (0.24")	95-100

26.0 CIRCUIT DIAGRAM

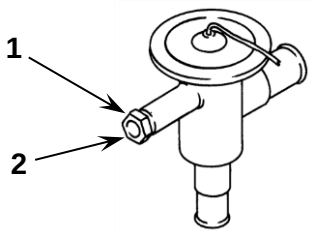


1 SUCTION AIR FILTER
2b SUCTION REGULATOR (UNLOADER)
3 OIL INJECTION SCREW COMPRESSOR ELEMENT
4 OIL DRAIN VALVE
5 AIR/OIL RECEIVER
6 OIL FILTER
7 THERMOSTATIC VALVE
8 OIL COOLER
9 PRESSURE SENSOR
10 COMPRESSOR CONTROLLER
11 MINIMUM PRESSURE VALVE
12 AIR-OIL SEPARATOR ELEMENT
13 AIR RECEIVER
14 SAFETY VALVE
15 TEMPERATURE SENSOR + SWITCH
16 DRIVE MOTOR
17 SOLENOID VALVE
18 SIGHT OIL LEVEL
19 VALVE PURGE AIR RECEIVER
20 NON-RETURN VALVE AND NOZZLE
21 NON-RETURN VALVE
22 NOZZLE

27.0 CALIBRATION FOR DRYER

BYPASS VALVE FOR HOT GAS
N.B. Tthese valves have already been calibrated and they do not require any adjistment. A dew point different from the rated one generally depends on causes which are not attributable to their operation.

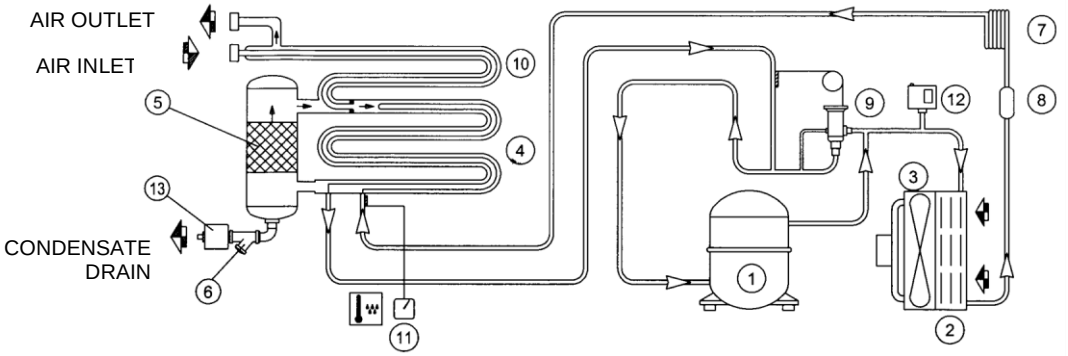
1) Closing cap
2) Adiusting screw



WORKING PRESSURES AND TEMPERATURES OF R513A

	SUCTION SIDE OF REFRIGERATION COMPRESSOR	
	Evaporating Temp. (°C)	Evaporating Pressure (bar)
RATED VALUES (Temp. 20 °C)	1 ÷ 2	**R513A** 2,35 ÷ 2,47

27.1 FLOW DIAGRAM OF THE DRYER



1 REFRIGERANT COMPRESSOR
2 GAS CONDENSER
3 FAN MOTOR
4 HEAT EXCHANGER
5 DEMISTER CONDENSATE SEPARATOR
6 IMPURITY TRAP
7 CAPILLARY TUBE
8 REFRIGERATION FLUID FILTER
9 HOT GAS BYPASS VALVE
10 AIR-TO-AIR EXCHANGER
11 DEW POINT THERMOMETER/CONTROLLER
12 FAN PRESSURE SWITCH
13 ELECTRONIC CONDENSATE DRAIN

ORIGINAL PART