



CE

**GENERAL MANUAL FOR
INSTALLATION**

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GB

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1 EC DECLARATION OF CONFORMITY

We declare under our sole responsibility that the machine complies with the following directives and amendments thereto:

Machinery Directive 98/37/EC.

Electromagnetic Compatibility Directive 89/336/EEC.

Low Voltage Directive 73/23/EEC.

2 GENERALITY

2.1 SUMMARY OF THE TERMS OF GUARANTEE

The guarantee is valid only if the installation regulations have been respected.

The guarantee covers flaws and defects.

Furthermore, the guarantee will hold only on the condition that the client suspends using the equipment as soon as a defect is detected.

The guarantee is valid if regular maintenance of the equipment has been properly done.

The guarantee covers replacement of parts which are found to be faulty.

2.2 RECEIPT OF THE UNIT

When the unit is received the client must check that no parts are missing.

Otherwise, a claim for non-delivery must immediately be sent to the shipper.

3 SAFETY REGULATIONS

3.1 INTRODUCTION

All units are designed, built and tested in conformity with the EEC Directives n°98/37 (Machinery Directive), 89/336 (Electromagnetic Compatibility Directive), 73/23 (Low Voltage Directive) and 97/23 Module H1 (Pressure Equipment Directive). Before using the machine read the recommendations set out in this manual.

3.2 DEFINITIONS

- **Owner:** legal representative of the company, corporate body or physical person that owns the plant in which the unit is being installed: he/she or it will be responsible for ensuring that all the safety regulations indicated in this manual and national regulations in force are observed.
- **Installer:** legal representative of the firm that the owner has put in charge of positioning and connecting hydraulically, electrically, etc. the unit to the plant: he/she is responsible for the handling and correct installation in conformity with what is indicated in this manual and the national regulations in force.
- **Operator:** the person authorized by the owner to carry out on the unit all operations of regulation and checking expressly indicated in this manual, and which must be strictly followed. His/her work will be limited only to what is clearly allowed.
- **Technician:** the person authorized for all EEC countries, excluding Italy, under his/her total responsibility to carry out all operations of ordinary and extraordinary maintenance. He/she will also carry out all regulations, checks, repairs and replacement of parts that should become necessary during the life of the unit itself.

3.3 ACCESS TO THE UNIT

The unit must be placed in an area where only the **OPERATORS** and **TECHNICIANS** can gain access to it; otherwise it must be surrounded by a fence that is at least 2 metres from the external surface of the machine. Within this limited area, **OPERATORS** and **TECHNICIANS** must be appropriately dressed (safety shoes, gloves, helmet, etc.). The staff of the **INSTALLER** or any other visitors must always be accompanied by an **OPERATOR**. For no reason whatsoever must non authorized persons be left on their own with the unit.

3.4 GENERAL PRECAUTIONS

The unit shall be earthed. Installation and/ or maintenance operations may be only performed after having disconnected and insulated the general power supply and control system.

- Check that the mains power supply corresponds to the specifications indicated on the ratings plate of the unit.
- The unit must be destined solely for the use for which it was designed. The manufacturer shall not be under any obligations whatsoever for uses differing from the specified use.
- Switch off the unit in the event of a breakdown or faulty operation.
- Do not supply the unit with any liquids except water or water mixed with a maximum amount of 50% ethylene or propylene glycol. Never exceed the maximum pressure limit (PS) of the water circuit of the unit indicated on the rating plate.
- The machine packaging can be dangerous. Keep out of the reach of children. The packaging material shall be neither discarded or burned in the environment.
- The **OPERATOR** must limit him/herself to the controls of the unit only; the only panel that can be opened by him/her is the one that accesses the control module - no other must be touched.
- The **INSTALLER** must limit him/herself to connecting the plant to the unit.
- Do not wear any jewellery, loose clothing or any other accessories that could get entangled somewhere.
- Use adequate protective devices (gloves, glasses or goggles, etc.) when carrying out work with naked flames (welding) or compressed air.
- If the unit is in a closed environment, ear defenders must be worn.
- Always use tools that are in good condition; be sure to be familiar with the instructions before putting them into practice.
- make sure that all tools, electrical cables or loose objects have been removed before closing and starting the unit again.
- the machine must not be installed in an explosive atmosphere; if it is destined for indoor use it must not be installed outside.
- the machine must not be installed in environments with electromagnetic fields exceeding those envisaged by the Electromagnetic Compatibility Directive 89/339.

The unit shall be supported by a bedplate which shall have the features specified by this manual. Failure to provide proper support may put the personnel at risk of serious injury.

The unit has not been designed to support any load and/or stress which might Derive from adjacent units, pipelines and/or structures. Any external load or stress may cause the structure of the unit to break or collapse as well as represent a serious danger for people. In these cases, any form of warranty will automatically become null and void.

3.5 PRECAUTIONS AGAINST OTHER POSSIBLE HAZARDS

Prevention of possible hazards arising from the control system

Errore. L'argomento parametro è sconosciuto.

- Make sure that the instructions have been fully understood before carrying out any work on the control panel.
- Always keep the instruction manual handy when working on the control panel.
- Start the unit only after having made sure that it has been perfectly connected to the plant.
- Warn the **TECHNICIAN** of any alarm that may have appeared on the unit.
- Do not reset the manual reset alarms without first having identified and removed the cause, as this will render the guarantee null and void.

Prevention of possible mechanical hazards

- Install the unit according to the instructions set out in this manual.
- Regularly carry out all the operations of maintenance foreseen in this manual.
- Wear a protective helmet before accessing the inside of the unit.

Prevention of possible electrical hazards

- Connect the unit to the mains electricity supply according to the instructions in this manual.
- Regularly carry out all the maintenance operations foreseen in this manual.
- Disable the unit from the mains using the main switch before opening the control panel.
- Check that the unit has been grounded correctly before starting it.
- Make sure all the electrical connections are firmly tightened and check the connecting cables, paying special attention to the state of insulation; replace all cables that are clearly worn and damaged.
- Periodically check the cables that are inside the panel.
- Check that all the circuit breakers are enabled.
- Do not use cables with inadequate sections nor extension cord connections, even for very short periods or emergencies.

Prevention of hazards or other nature

- Connect up the utilities to the unit following the indications set out in this manual and on the panelling of the unit itself.
- The antifreeze added to the hydraulic circuit contains harmful substances. Do not drink from the hydraulic circuit and make sure it does not touch your skin, eyes or clothing.
- If a part needs to be dismantled, make sure it is correctly re-assembled before starting the unit.
- Keep at hand a fire extinguisher suitable for electrical appliances. Check it and have it serviced as recommended on the instructions plate.
- On units installed indoors, check that no hazards can occur if the safety valves trigger.
- Stop any fluid leaking inside or outside the unit.
- Do not store inflammable liquids near the unit.
- Do not bend or hit pipes containing pressurised fluids.

3.6 PRECAUTIONS THAT MUST BE TAKEN DURING MAINTENANCE

Maintenance must be carried out only by authorised technicians. Before any kind of maintenance is carried out the following measures must be observed:

- the unit must be isolated from the electricity mains using the external main switch;
- hang a "Maintenance - do not switch on" notice on the external main switch;
- make sure that any remote on-off controls are disabled;
- be equipped with appropriate accident prevention equipment (helmet, insulated gloves, protective goggles, safety shoes, etc.).

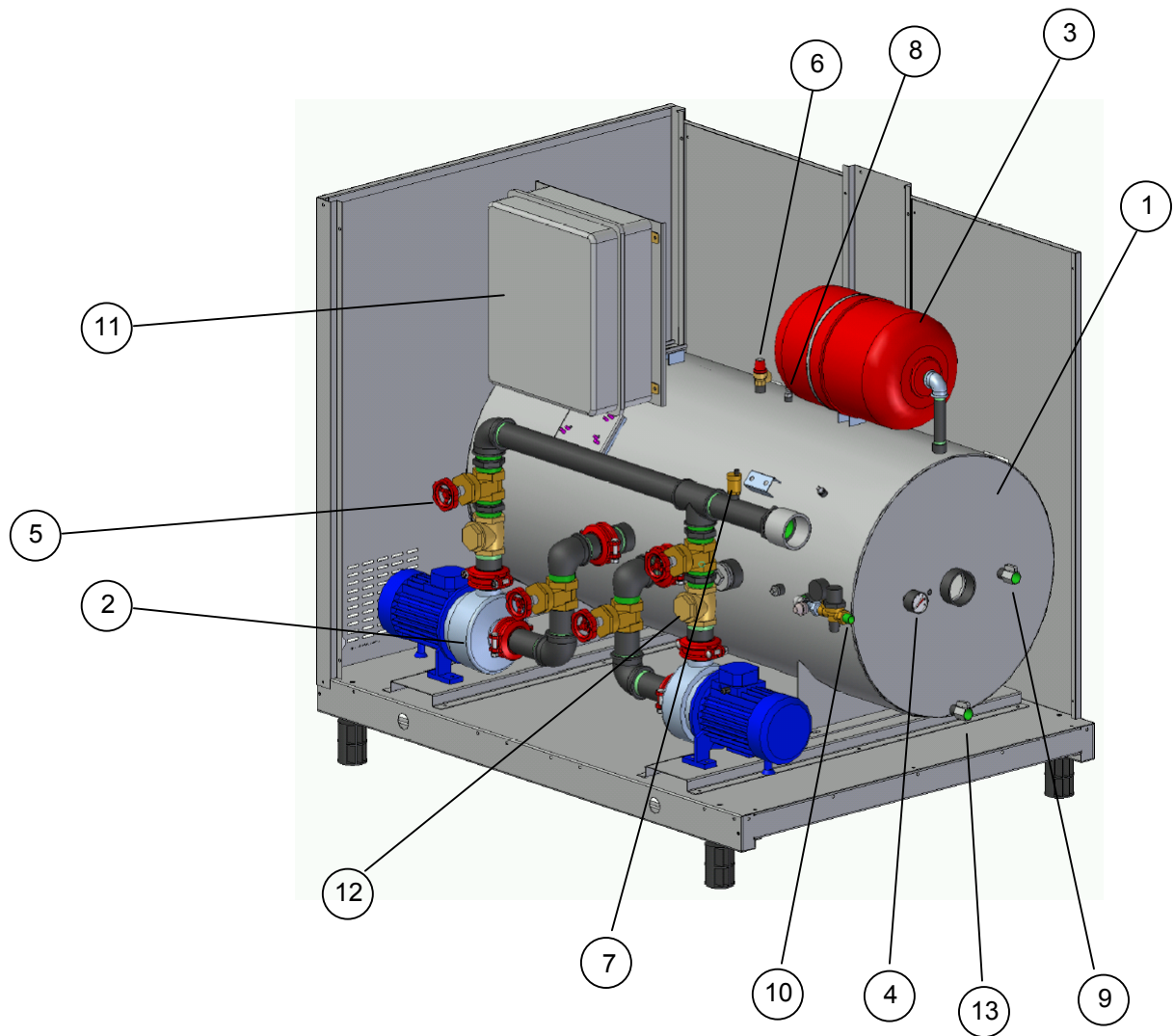
Whenever measurements must be taken or checks performed with the machine running, it is necessary to:

- work on the open switch board for as short a time as possible;
- close the switch board as soon as the single measurement or check has been performed;
- for external units, do not work on the machine in adverse weather conditions such as rain, snow, fog, etc.

Furthermore, the following precautions must always be taken:

- take measures to protect yourself from any leakage of fluids at dangerous temperatures during bleeding.

4 DESCRIPTION OF GROUP



REF.	DESCRIPTION
1	Tank
2	Circulation pump
3	Expansion vessel
4	Pressure gauge
5	Check valves
6	Safety valve
7	Automatic vent valve
8	Vent valve
9	Replenishment tap
10	Automatic replenishment unit
11	Electrical panel
12	Check valve (for 2 pumps only)
13	Storage tank discharge

5 CHARACTERISTICS OF GROUP

MODELLO POMPA	Capacità accumulo	Wsb1	Wsb2	F.L.I.	F.L.A.	F.L.A.	Q min	H max	Q max	H min	Ve	Pve	Ps	T min
					(400/3/50)	(230/3/50)								
	(l)	(Kg)	(Kg)	(kW)	(A)	(A)	(m3/h)	(kPa)	(m3/h)	(kPa)	(l)	(bar)	(bar)	(°C)
A	300	186	216	1.1	2.5	4.3	6	188	24	83	25	1.5	3	-10
	500	208	238	1.1	2.5	4.3	6	188	24	83	25			
B	300	188	220	1.5	3.2	5.5	6	220	24	122	25			
	500	210	242	1.5	3.2	5.5	6	220	24	122	25			
C	300	188	220	1.5	3.4	5.9	10	170	45	61	25			
	500	210	242	1.5	3.4	5.9	10	170	45	61	25			
D	300	191	225	2.2	4.8	8.3	10	230	45	112	25			
	500	213	247	2.2	4.8	8.3	10	230	45	112	25			
E	300	194	231	3	5.6	9.7	10	230	45	112	25			
	500	215	253	3	5.6	9.7	10	248	45	137	25			
F	750	341	428	3	6.2	10.8	30	191	72	103	25			
	1000	364	455	3	6.2	10.8	30	191	72	103	25			
	1500	513	586	3	6.2	10.8	30	191	72	103	2 x 25			
	2500	565	638	3	6.2	10.8	30	191	72	103	3 x 25			
G	750	370	485	5.5	11	/	30	308	84	145	25			
	1000	392	512	5.5	11	/	30	308	84	145	25			
	1500	565	696	5.5	11	/	30	308	84	145	2 x 25			
	2500	613	732	5.5	11	/	30	308	84	145	3 x 25			
H	750	373	493	5.5	11	/	48	210	108	137	25			
	1000	396	520	5.5	11	/	48	210	108	137	25			
	1500	569	696	5.5	11	/	48	210	108	137	2 x 25			
	2500	617	740	5.5	11	/	48	210	108	137	3 x 25			
I	750	377	501	7.5	14.6	/	48	260	120	180	25			
	1000	400	528	7.5	14.6	/	48	260	120	180	25			
	1500	569	696	7.5	14.6	/	48	260	120	180	2 x 25			
	2500	617	740	7.5	14.6	/	48	260	120	180	3 x 25			
L	750	377	501	11	21.2	/	48	342	120	249	25			
	1000	400	528	11	21.2	/	48	342	120	249	25			
	1500	569	696	11	21.2	/	48	342	120	249	2 x 25			
	2500	617	740	11	21.2	/	48	342	120	249	3 x 25			
M	1500	628	814	15	28.6	/	48	405	138	288	2 x 25			
	2500	680	866	15	28.6	/	48	405	138	288	3 x 25			
O	1500	634	826	15	28.6	/	84	330	180	220	2 x 25			
	2500	686	878	15	28.6	/	84	330	180	220	3 x 25			
P	1500	646	850	18.5	34.2	/	84	385	216	220	2 x 25			
	2500	698	902	18.5	34.2	/	84	385	216	220	3 x 25			
Q	1500	660	878	22	40.3	/	84	475	180	325	2 x 25			
	2500	712	930	22	40.3	/	84	475	180	325	3 x 25			

REF.	DESCRIPTION
F.L.I.	Absorbed power at full load
F.L.A.	Absorbed current at full load
Qmin	Minimum capacity
Qmax	Maximum capacity
Hmin	Minimum head of pump
Hmax	Maximum head of pump
Wsb1	HPT 1 pump transport weight
Wsb2	HPT 2 pumps transport weight
Ve	Capacity of expansion vessel
Pve	Expansion vessel preload
Ps	Maximum operating pressure
Tmin	Minimum temperature of fluid

Errore. L'argomento parametro è sconosciuto.

6 INSTALLATION

6.1 HANDLING, LIFTING AND POSITIONING THE UNIT

Units are designed for overhead lifting, using the eyebolts or tubular bars fitted in dedicated holes in the machine base. Do not do any lifting with equipment which is inadequate or not in perfect working order; have the work done by a specialised firm. Do not tilt the machine more than 15° during handling.

Before handling, check that all the panels are fastened.

Use spread bars to keep the lifting cables or chains clear of the unit.

Before handling the device, make sure the site you have chosen for the installation can withstand its weight and support its mechanical impact. The unit shall never be placed on rollers or lifted by means of a fork lift truck.

Act as follows to lift and handle the unit:

- Insert and secure the eyebolts into the frame holes which have been marked on purpose.
- Connect the cables to the eyebolts.
- Insert the spacer between the cables.
- Provide for hooking at the centre of gravity of the device.
- Cables shall have such a length that the angle they form with the horizon when under tension is not less than 45°.

(see Fig.1)

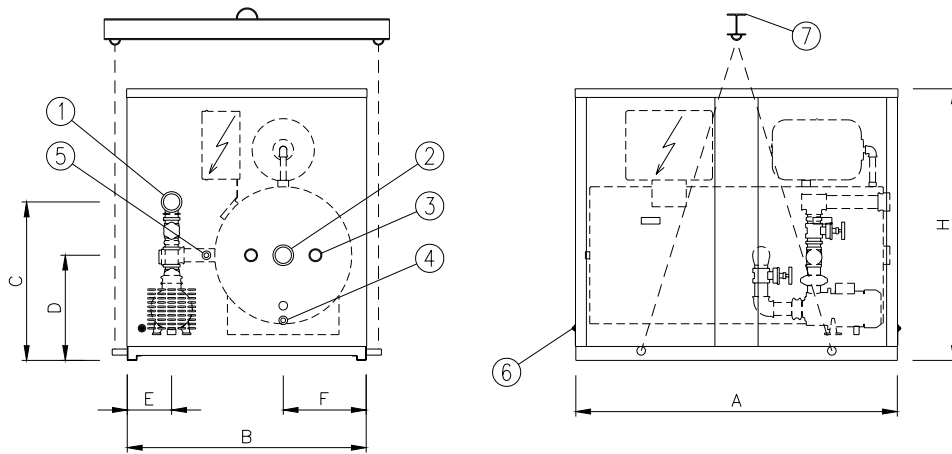


Fig. 1

While lifting and handling the unit, pay attention. Otherwise, you might damage the unit.

The sides of the unit shall be protected by cardboard or plywood sheets.

Until the unit is ready for operation, do not remove the plastic envelope and the coil protections which are intended to prevent dirt, dust and any foreign matter from penetrating into the unit or from damaging the external surfaces.

HPT groups have frames complete with holes for the anchorage of any rubber shock absorber. It is not necessary to anchor the unit to the bedplate unless the installation site is exposed to a high risk of earthquake or the unit is installed at a high level and/or on a frame of metal section bars.

Before installing the unit, make sure that the building structure and/or the supporting surface can withstand the weight of the device. The weights of the units are detailed in Chapter 5.

These units have been designed to be installed on the floor, in the open air.

When the unit is to be installed on the ground, provide for a concrete bedplate which shall assure a uniform distribution of the weights.

When selecting the installation site, never forget to consider as follows:

- The unit shall never be installed in areas exposed to flooding or beneath down pipes, etc.
- The installation site shall be characterised by the presence of adequate spaces for air circulation and maintenance.

7 HYDRAULIC CONNECTIONS

Protect the hydraulic circuit with antifreeze when shutting down a charged system for winter. If necessary, drain the water inside the exchangers. The connecting pipes must be properly supported so as not to weigh on the unit.

Moreover, act as follows:

- Install the on/off valves on the inlet and outlet lines.
- Arrange a by-pass complete with an on/off valve around the unit.
- Arrange some air vent valves at the highest points of the water lines.
- Arrange drainage points complete with plugs, cocks, etc. at the lowest points of the water lines.
- Insulate the water lines to avoid any heat loss.

Before filling the installation, make sure its inner side is free of any foreign matter, such as sand, crushed stones and welding scales, coating drops and any other material which might damage the evaporator.

It is advisable to bypass the unit when flushing the circuit.

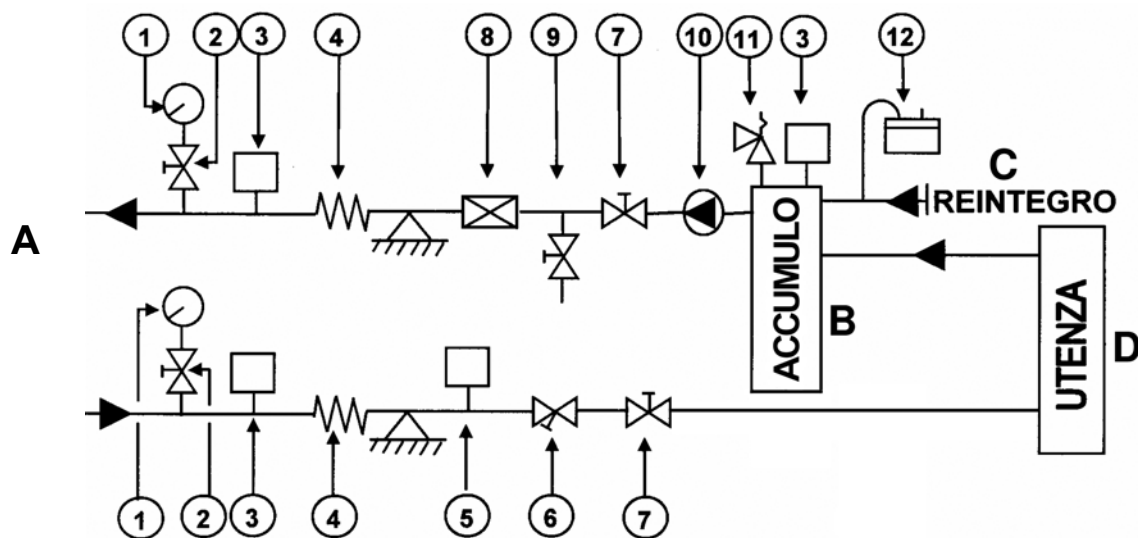
The water used to fill the circuit shall be treated in such a way that the pH will have the correct value.

The inlet and outlet connections of the circulating fluid must be connected in compliance with the instructions shown by the labels in the proximity of the connections.

Connect the system water lines with the unit connections.

The directions for installation set out above represent a necessary condition for the validity of the guarantee.

Fig. 2



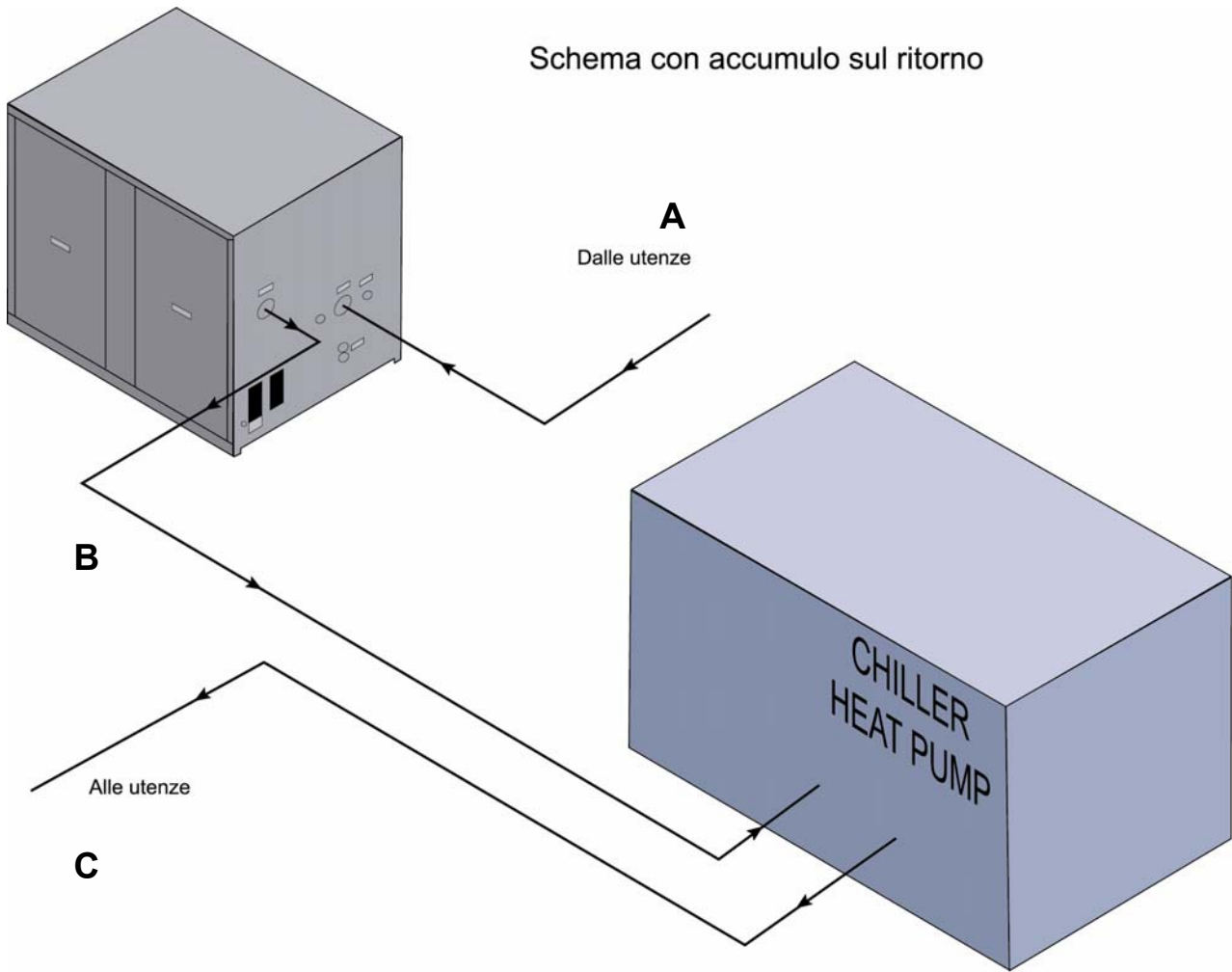
A. CLIMAVENETA UNIT
B. TANK
C. REINTEGRATION
D. USE

5. FLOW SWITCH
6. CALIBRATION VALVE
7. SHUT-OFF VALVE
8. FILTER
9. DRAIN VALVE
10. PRIMARY CIRCUIT CIRCULATION PUMP
11. SAFETY VALVE
12. EXPANSION TANK

1. PRESSURE GAUGE
2. SHUT-OFF VALVE
3. AUTOMATIC AIR VALVE
4. VIBRATION DAMPING JOINT

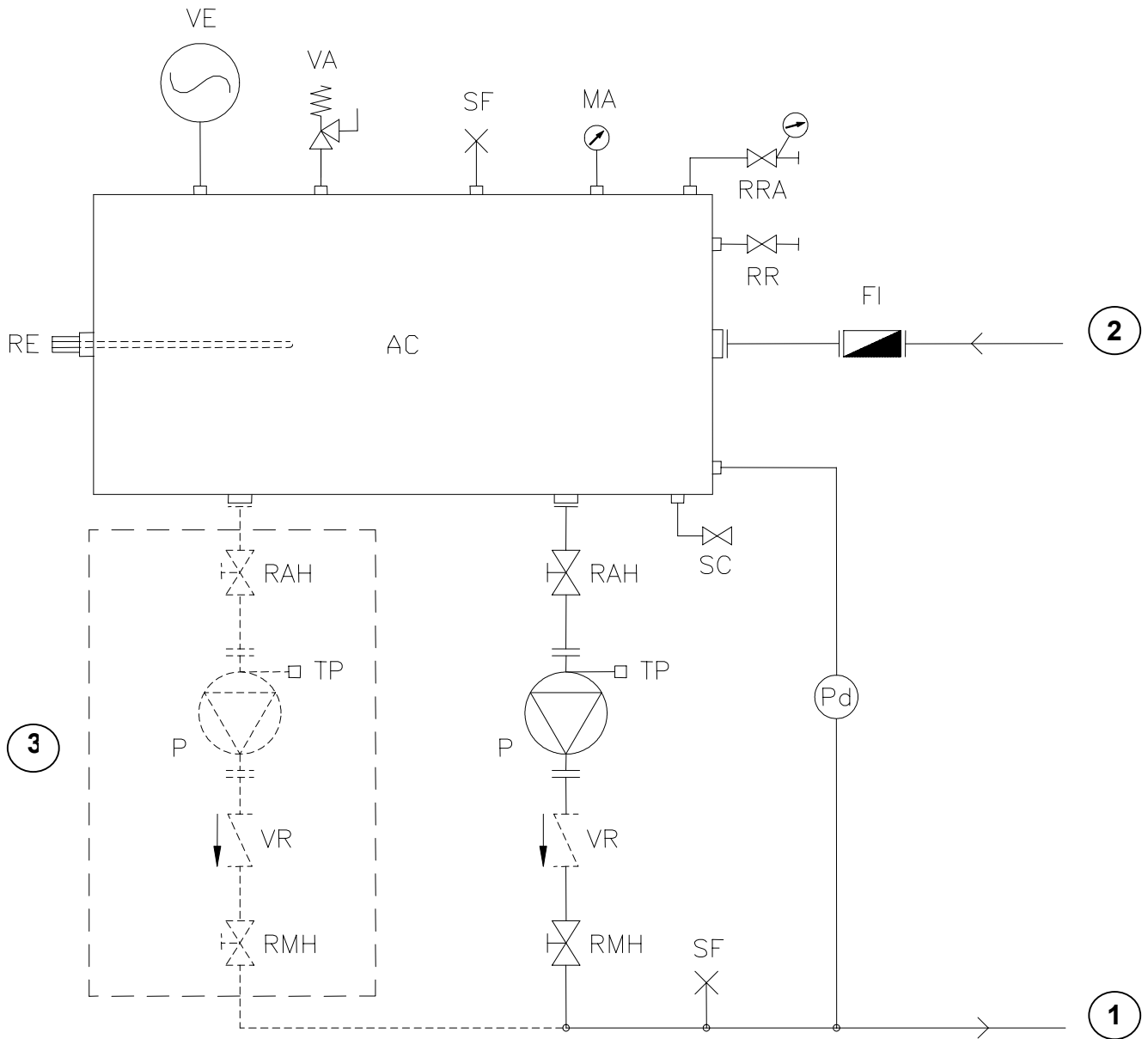
Fig. 3

Schema con accumulo sul ritorno



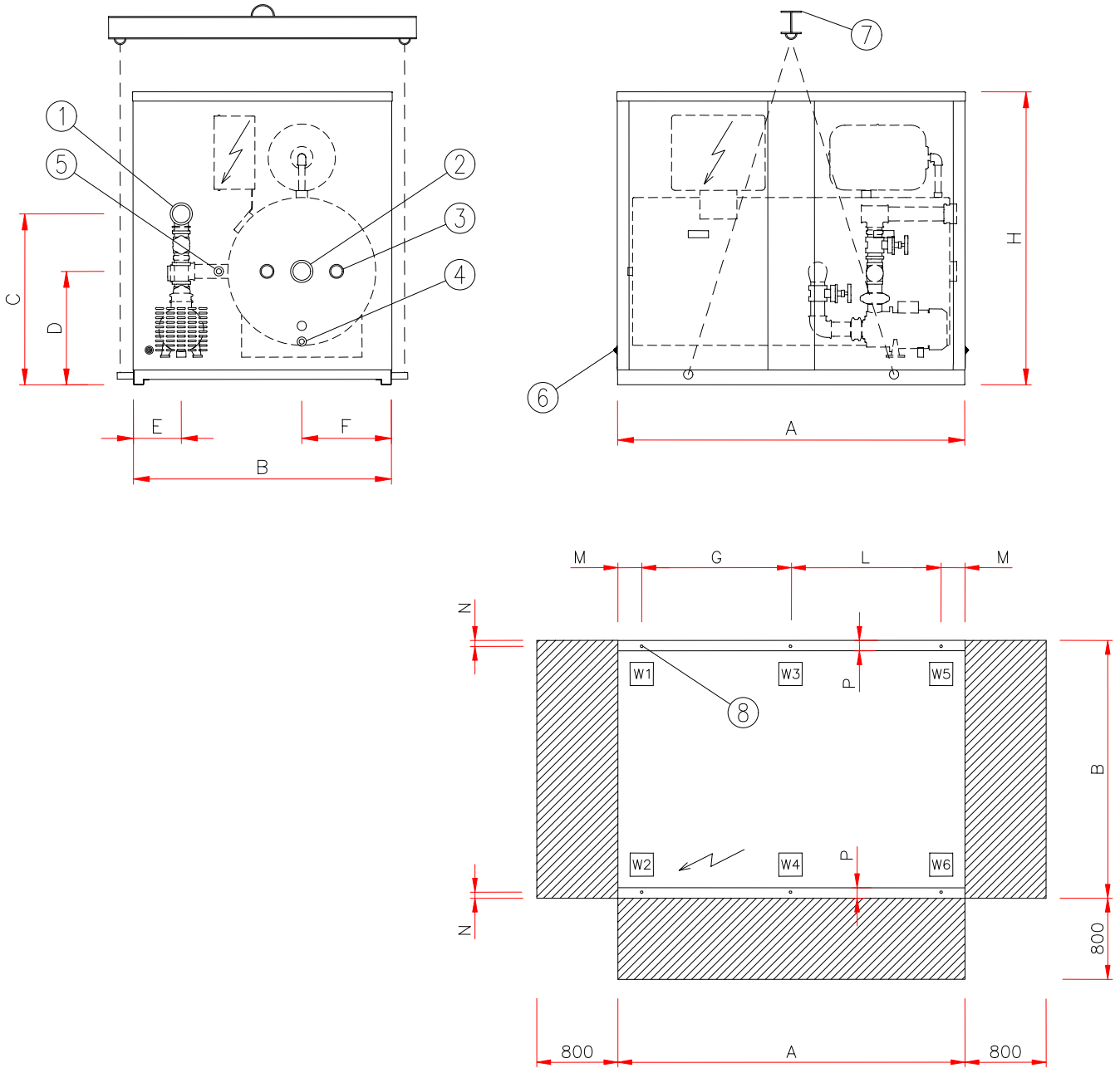
A. Diagram with storage tank on return line B. From users C. To users

8 HYDRAULIC DIAGRAM



REF.	DESCRIPTION	REF.	DESCRIPTION	REF.	DESCRIPTION
AC	Storage tank	RAH	Pump inlet tap	VE	Expansion vessel
FI	Mesh filter (optional)	RE	Electric heater (optional)	VR	Check valve (with 2 pumps only)
MA	Pressure gauge	RMH	Pump delivery tap		
P	Circulation pump	RR	Replenishment tap		
Pd	Differential pressure switch	RRA	Automatic replenishment tap	1	System delivery line
SC	Discharge valve	TP	Drain plug	2	System return line
SF	Relief valve	VA	Safety valve	3	Second pump (optional)

9 SCALE DRAWING OF HPT GROUP



HPT	A	B	H	C	D	E	F	G	L	M	N	P
(l)	mm											
300 / 500	1504	1120	1265	738	490	212	388	1298	0	103	26	45
750 / 1000	2044	1200	1510	940	604	185	440	919	919	103	26	45
1500 / 2500	2260	1900	1782	1145	829	262	703	1077	1077	53	53	100

REF.	DESCRIPTION	REF.	DESCRIPTION
1	System delivery line (UNI ISO 7/1 Rp 2½ connector for HPT 300 and 500 litres)	3	Replenishment tap
	System delivery line (UNI ISO 7/1 Rp 3 connector for HPT 750 and 1000 litres)	4	Storage tank discharge
	System delivery line (UNI ISO 7/1 Rp 4 connector for HPT 1500 and 2500 litres)	5	Automatic replenishment unit
2	System return line (UNI ISO 7/1 Rp 2½ connector for HPT 300 and 500 litres)	6	Power supply
	System return line (UNI ISO 7/1 Rp 3 connector for HPT 750 and 1000 litres)	7	Lifting
	System return line (UNI ISO 7/1 Rp 4 connector for HPT 1500 and 2500 litres)	8	Points of support (4-6 holes M12/Ø14)

10 WEIGHT DISTRIBUTION OF HPT GROUP

Errore. L'argomento parametro è sconosciuto.

MODELLO POMPA	Capacità accumulato	W1	W2	W3	W4	W5	W6	MODELLO POMPA	Capacità accumulato	W1	W2	W3	W4	W5	W6
	(l)	(Kg)							(l)	(Kg)					
AN	300	148	96	154	102	/	/	AR	300	152	112	153	113	/	/
	500	219	134	226	141	/	/		500	227	153	227	153	/	/
BN	300	148	96	154	102	/	/	BR	300	152	112	153	113	/	/
	500	219	134	226	141	/	/		500	227	153	227	153	/	/
CN	300	148	96	154	102	/	/	CR	300	152	112	153	113	/	/
	500	219	134	226	141	/	/		500	227	153	227	153	/	/
DN	300	148	96	154	102	/	/	DR	300	152	112	153	113	/	/
	500	219	134	226	141	/	/		500	227	153	227	153	/	/
EN	300	148	96	154	102	/	/	ER	300	152	112	153	113	/	/
	500	219	134	226	141	/	/		500	227	153	227	153	/	/
FN	750	232	123	238	129	244	135	FR	750	245	152	243	150	241	149
	1000	297	148	303	154	309	160		1000	310	181	308	179	306	177
	1500	369	291	375	298	382	305		1500	379	321	377	319	376	318
	2500	571	446	578	452	584	459		2500	581	456	588	462	594	469
GN	750	230	128	239	137	249	147	GR	750	245	172	245	172	245	172
	1000	294	153	304	163	314	173		1000	311	198	310	197	309	196
	1500	368	305	376	314	385	322		1500	383	353	382	352	381	351
	2500	576	451	583	457	589	464		2500	589	497	586	494	583	491
HN	750	230	128	239	137	249	147	HR	750	245	172	245	172	245	172
	1000	294	153	304	163	314	173		1000	311	198	310	197	309	196
	1500	368	305	376	314	385	322		1500	383	353	382	352	381	351
	2500	576	451	583	457	589	464		2500	589	497	586	494	583	491
IN	750	230	128	239	137	249	147	IR	750	245	172	245	172	245	172
	1000	294	153	304	163	314	173		1000	311	198	310	197	309	196
	1500	368	305	376	314	385	322		1500	383	353	382	352	381	351
	2500	576	451	583	457	589	464		2500	589	497	586	494	583	491
LN	750	235	133	244	142	254	152	LR	750	255	182	255	182	255	182
	1000	292	159	305	172	318	185		1000	314	215	313	214	312	212
	1500	365	315	377	327	389	338		1500	382	377	381	376	380	375
	2500	571	459	581	469	591	479		2500	587	519	584	516	581	513
MN	1500	365	318	379	331	392	345	MR	1500	388	388	387	387	386	386
	2500	570	470	581	482	593	499		2500	587	546	584	543	581	539
ON	1500	365	318	379	331	392	345	OR	1500	390	390	389	389	388	388
	2500	570	470	581	482	593	499		2500	587	546	584	543	581	539
PN	1500	367	320	381	333	394	347	PR	1500	394	394	393	393	392	392
	2500	572	472	583	484	595	501		2500	591	550	588	547	585	543
QN	1500	370	323	384	336	397	350	QR	1500	399	399	398	398	397	397
	2500	575	475	586	487	598	504		2500	596	555	593	552	590	548

11 ELECTRIC WIRING CONNECTION

11.1 ELECTRICITY SUPPLIES AND POWER CONNECTION

The specifications of the mains supply must comply with the standards EN 60204-1 and be sufficient for the absorption requirements of the unit indicated in Chapter 5. The mains supply voltage must correspond to the rated value +/- 10%, with a maximum phase difference of 2%. Refer to local regulations.

The electrical distribution system must be able to supply the power absorbed by the device.

Disconnectors and magneto thermal switches must be dimensioned in such a way that they can manage the maximum current.

The power supply cables shall be run through the cable entries arranged on the unit front panel and inserted into the holes at the bottom of the electrical board.

Install an overload cut-out device, not included in the supply, on the supply line of the switchboard in compliance with the regulations in force.

Supply with unit switchboard with a cable with an appropriate diameter for unit absorption (see wiring diagram in the next page). The control circuit is shunted off the power circuit from inside the switchboard.

11.2 ELECTRICAL CONNECTIONS

The terminals shall be connected according to the connection diagram.

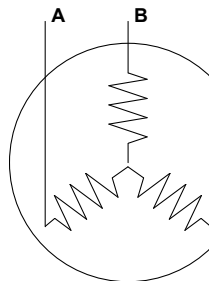
Before connecting the power supply lines, make sure that the voltage value lies within the limits specified by the Electrical Data indicated on the wiring diagram.

Do not operate the electric motors when the voltage phase difference is greater than 2%. Use the following formula to check:

$$\% \text{ difference} = \frac{\text{Max voltage difference from the average}}{\text{average voltage}} \times 100$$

For example: : rated mains voltage 400 - 3 - 50
AB = 409 V ; BC = 398 V ; AC 396 V
average voltage = (409 + 398 + 396) / 3 = 401 V

$$\text{difference \%} = \frac{(409 - 401)}{401} \times 100 = 1,99$$



IMPORTANT:

If the mains voltage has a phase difference greater than 2%, contact the electricity company. If the unit is operated with a voltage phase difference of more than 2% THE GUARANTEE SHALL BE CONSIDERED NULL AND VOID.

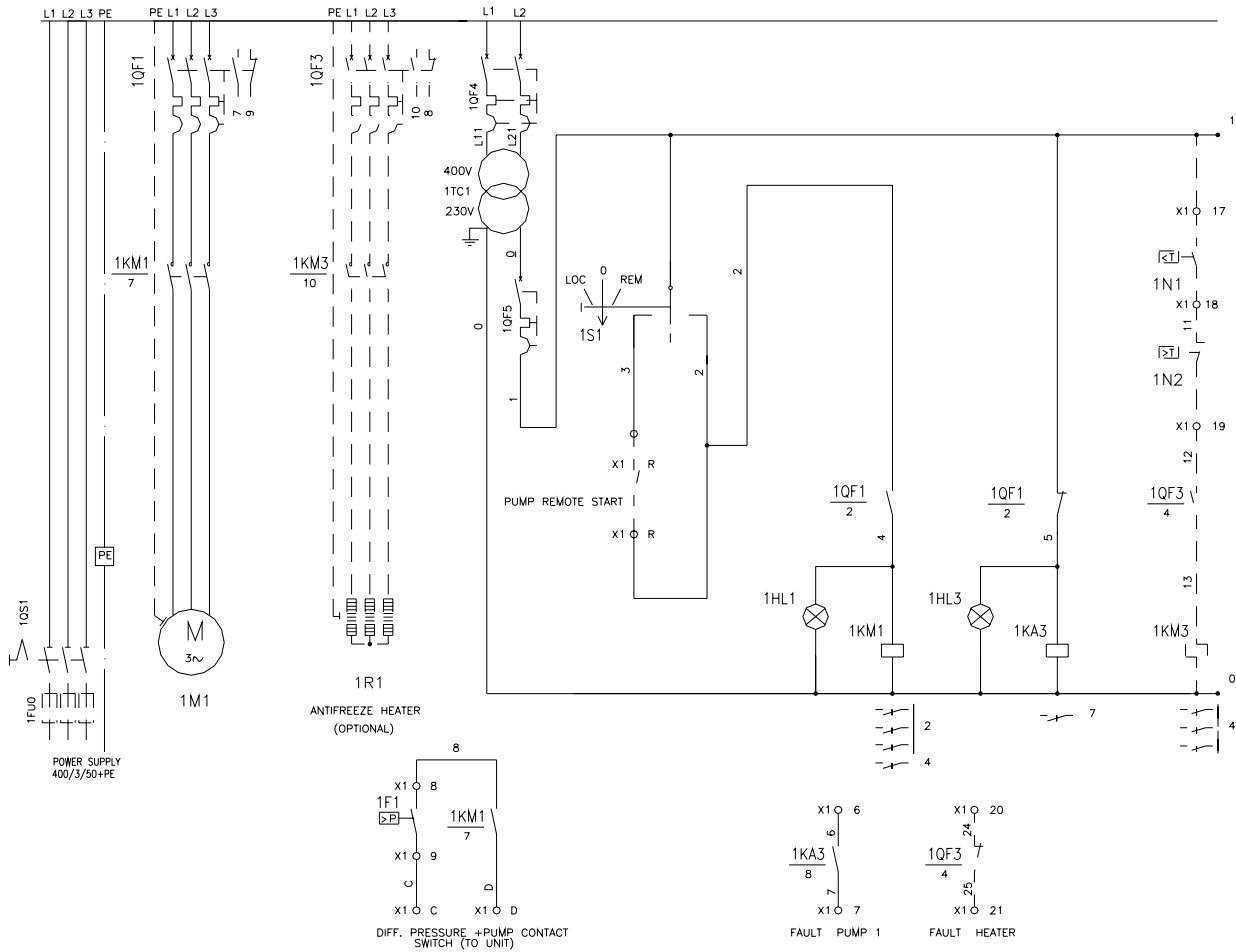
Before starting up the unit, it is advisable to check that electrical systems have been implemented to guarantee conformity with the Electromagnetic Compatibility Directive.

If the unit should be supplied by a line whose unbalance is higher than the admitted value, this will automatically make the warranty null and void.

It is absolutely necessary to make sure that the pumps rotate in the correct direction (shown by the arrow on the pump case).

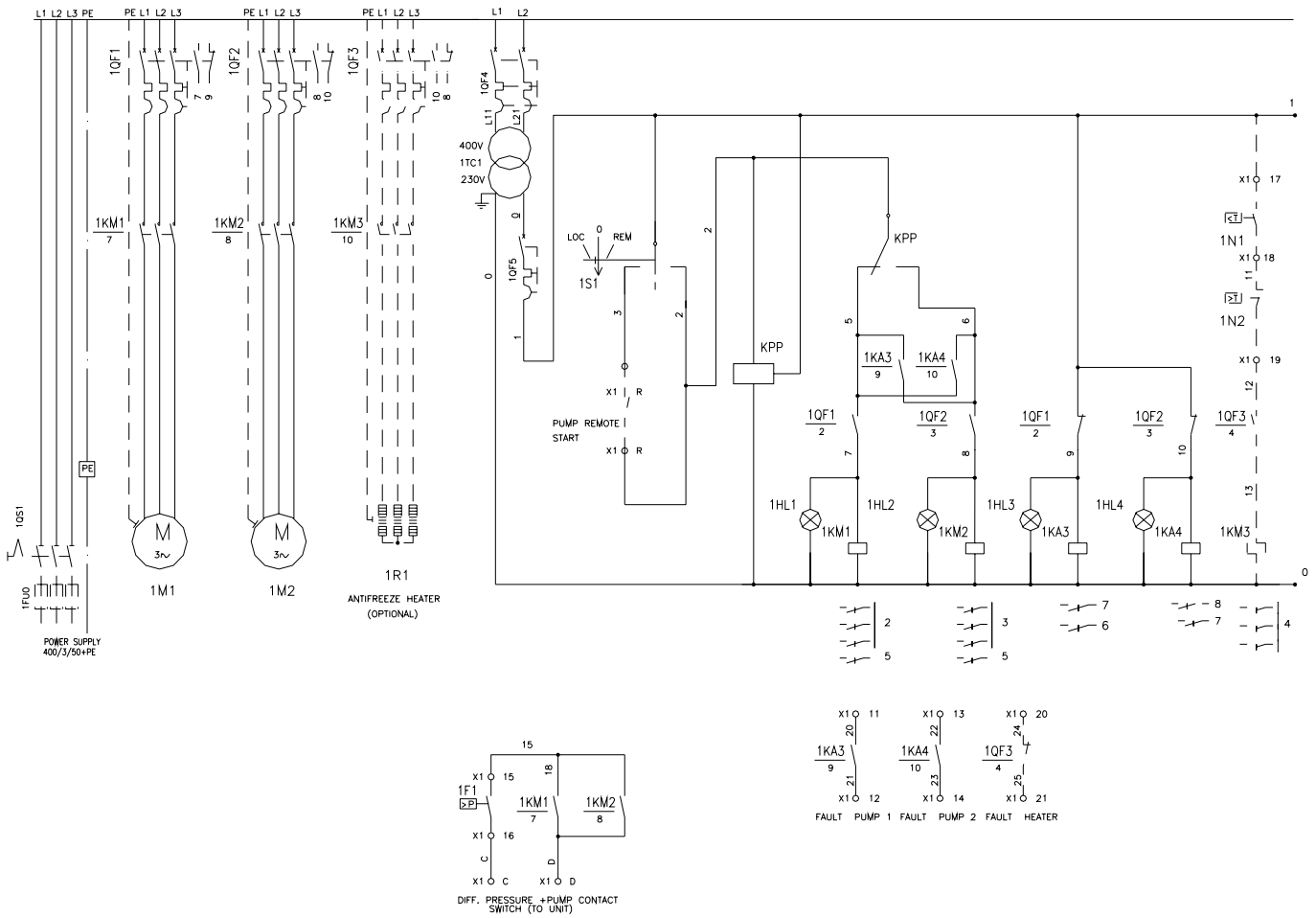
Otherwise, exchange the connection of two of the three phases of the pump motor in question.

12 WIRING DIAGRAM OF HPT WITH 1 PUMP (400V/3PH/50HZ)



REF.	DESCRIPTION	REF.	DESCRIPTION	REF.	DESCRIPTION
1FU0	General fuses (in field)	1R1	Antifreeze heater	1	Power supply
1QS1	Isolating switch	1KA3-1KA4	Auxiliary relays	2	Antifreeze heater (optional)
1QF1-1QF2	Automatic pump switches	1N1	Antifreeze thermostat	3	Start for unit (CVM20-300-3000)
1QF3	Automatic antifreeze heater switch	1N2	Storage tank safety thermostat	4	Differential pressure + pump contact switch
1QF4-1QF5	Magnetic switches for auxiliaries	1S1	Loc/0/rem switch	5	Pump remote start
1TC1	Transformer for auxiliaries	1S2	Pump1-pump2 switch	6	Fault pump 1
1KM1-1KM2	Pump contactors	1HL1-1HL2	Pump OK LED	7	Fault heater
1KM3	Antifreeze heater contactor	1HL3-1HL4	Pump fault LED	8	Fault pump 2
1M1-1M2	Pumps	1F1	Differential pressure switch		

13 WIRING DIAGRAM OF HPT WITH 2 PUMPS (400V/3PH/50HZ)



REF.	DESCRIPTION	REF.	DESCRIPTION	REF.	DESCRIPTION
1FU0	General fuses (in field)	KPP	Step by step relay	1	Power supply
1QS1	Isolating switch	1KA3-1KA4	Auxiliary relays	2	Antifreeze heater (optional)
1QF1-1QF2	Automatic pump switches	1N1	Antifreeze thermostat	3	Start for unit (CVM20-300-3000)
1QF3	Automatic antifreeze heater switch	1N2	Storage tank safety thermostat	4	Differential pressure + pump contact switch
1QF4-1QF5	Magnetic switches for auxiliaries	1S1	Loc/0/rem switch	5	Pump remote start
1TC1	Transformer for auxiliaries	1S2	Pump1-pump2 switch	6	Fault pump 1
1KM1-1KM2	Pump contactors	1HL1-1HL2	Pump OK LED	7	Fault heater
1KM3	Antifreeze heater contactor	1HL3-1HL4	Pump fault LED	8	Fault pump 2
1M1-1M2	Pumps	1F1	Differential pressure switch		
1R1	Antifreeze heater				

14 MAXIMUM WATER CONTENT OF INSTALLATION AND EXPANSION VESSEL CALIBRATION

The table nr. 1 gives the maximum water content of the installation, compatible with the expansion vessel capacity, provided in all standard HPT models, and the intervention value of the security valve (3 bar for each model available). The values given in table nr. 1 are referred to two maximum and minimum temperature conditions. If the effective water content of the hydraulic plant (including storage tank) exceeds the specification in the table at the working conditions, an additional expansion vessel should be installed, sized with reference to the extra volume of water.

The table nr. 2 offers the maximum plant contents for operating conditions with glycol solutions. The values are obtained by multiplying the reference value in Tab. 1 by the correction factor in Tab. 2.

Altezza idraulica Hydraulic height	[m]	25	20	15	10
Taratura del vaso di espansione Expansion tank calibration	[bar]	2,8	2,3	1,8	Standard
Valore di riferimento contenuto d'acqua Reference value water content	(1) [l]	164	574	984	1.230
Valore di riferimento contenuto d'acqua Reference value water content	(2) [l]	105	368	630	788

Tab. 1

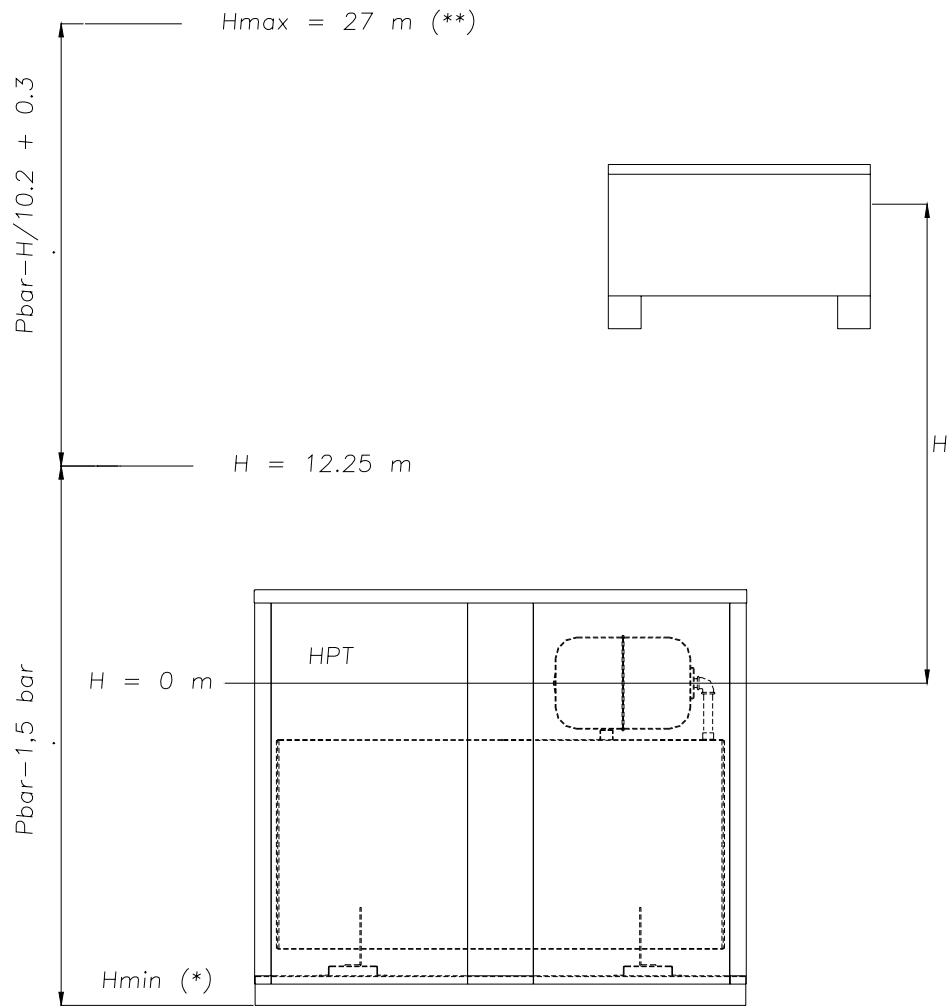
Reference operative conditions:

(1) Cooling: Max Water Temp. = 40 °C, Min. Water Temp. = 4 °C.

(2) Heating (heat pump): Max Water Temp. = 50 °C, Min. Water Temp. = 4 °C.

Acqua glicolata Glycole mix.	Temp. acqua • Water temp. °C		Coefficiente di correzione Correction factor	Valori di riferimento Reference values
	max.	min.		
10%	40	-2	0,507	(1)
10%	60	-2	0,686	(2)
20%	40	-4	0,434	(1)
20%	60	-4	0,604	(2)
30%	40	-6	0,393	(1)
30%	60	-6	0,555	(2)

Tav. 2



- * Ensure that the highest terminal unit doesn't exceed 27 metres of level difference.
- ** Ensure that the lowest terminal unit can support the global pressure present at the point.

15 START-UP

15.1 PRELIMINARY CHECKS

The following operations shall be performed before the arrival of our personnel on site in order to start up the unit.

- Check the section of supply cables, the ground connection, the clamps of terminals when the main disconnector is open.
- Make sure the unbalance between the supply line phases is within the limits as above.
- Make sure that the direction of rotation of the pumps is correct.
- Make sure that the water inlets and outlets are correct and that the components of the external water circuits comply with the manufacturers' instructions for installation.
- Make sure that the water circuits have been filled and the circulation of the various fluids occurs.
- Make sure that there is no air inside.

15.2 STARTING

The starting sequence shall be performed as follows:

- Make sure that the whole external equipment is perfectly working and the control devices of the installation are properly calibrated.
- Set the main disconnector to I (on) to power on the electrical board.
- Power on the chiller / heat pump so as to start the water pump. Make sure the circulating flow rate is correct.
- Make sure that the hydraulic circuit is completely filled of water before starting.

15.3 WINTER STOP OF THE UNIT

To stop the unit, follow the procedure here below:

- Set the main switch to OFF so as to open it and power off the unit.

Before winter it is necessary to drain the water in the circuit or to replace it with a glycol solution so as to prevent the ice from damaging the pipelines.

If the kit is complete with an optional antifreeze heater, make sure that the circuit on/off valves are open and that the kit is live.

This will enable the antifreeze heater and the water pump to start if the outside temperature should reach the value that has been set for the antifreeze protection.

16 MAINTENANCE

7.1. GENERALITY

Unless otherwise specified, the maintenance operations here below can be performed by any maintenance technician who has been specifically trained.

HPT unit have been designed for constant operation, provided that they are regularly serviced and operated within the limits specified by this manual. Every unit shall be serviced and regularly inspected by qualified personnel.

It is the User's responsibility to fulfil these maintenance requirements and/or make an agreement with a Service Centre so as to protect the operation of the device.

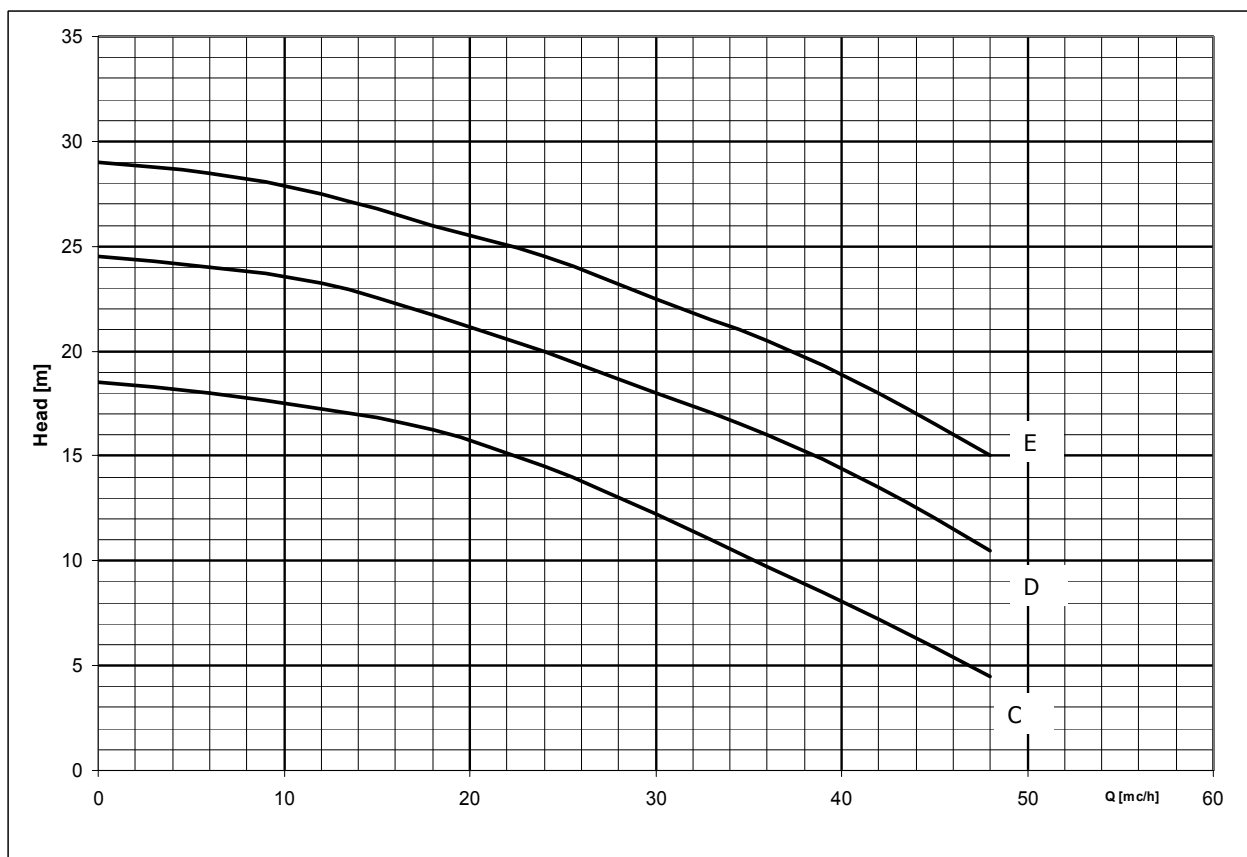
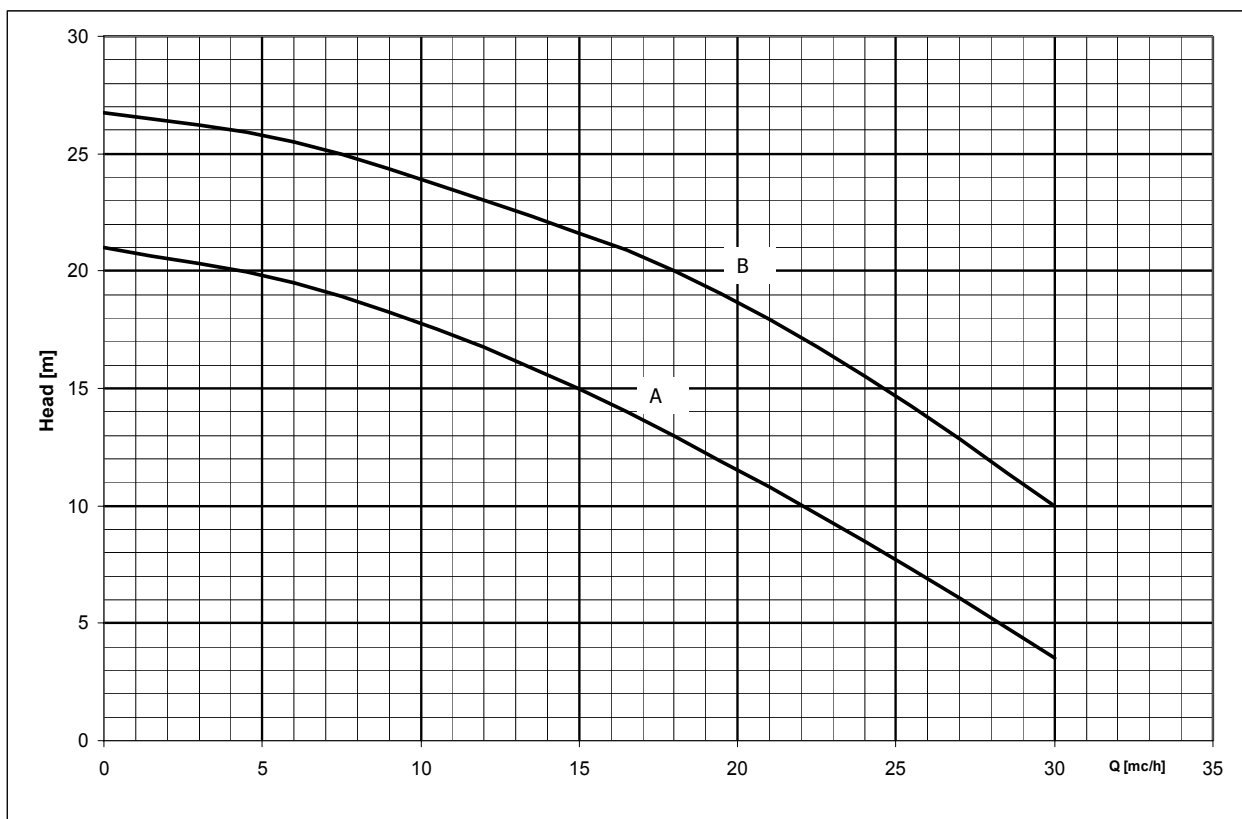
17.2. PROGRAMMED MAINTENANCE

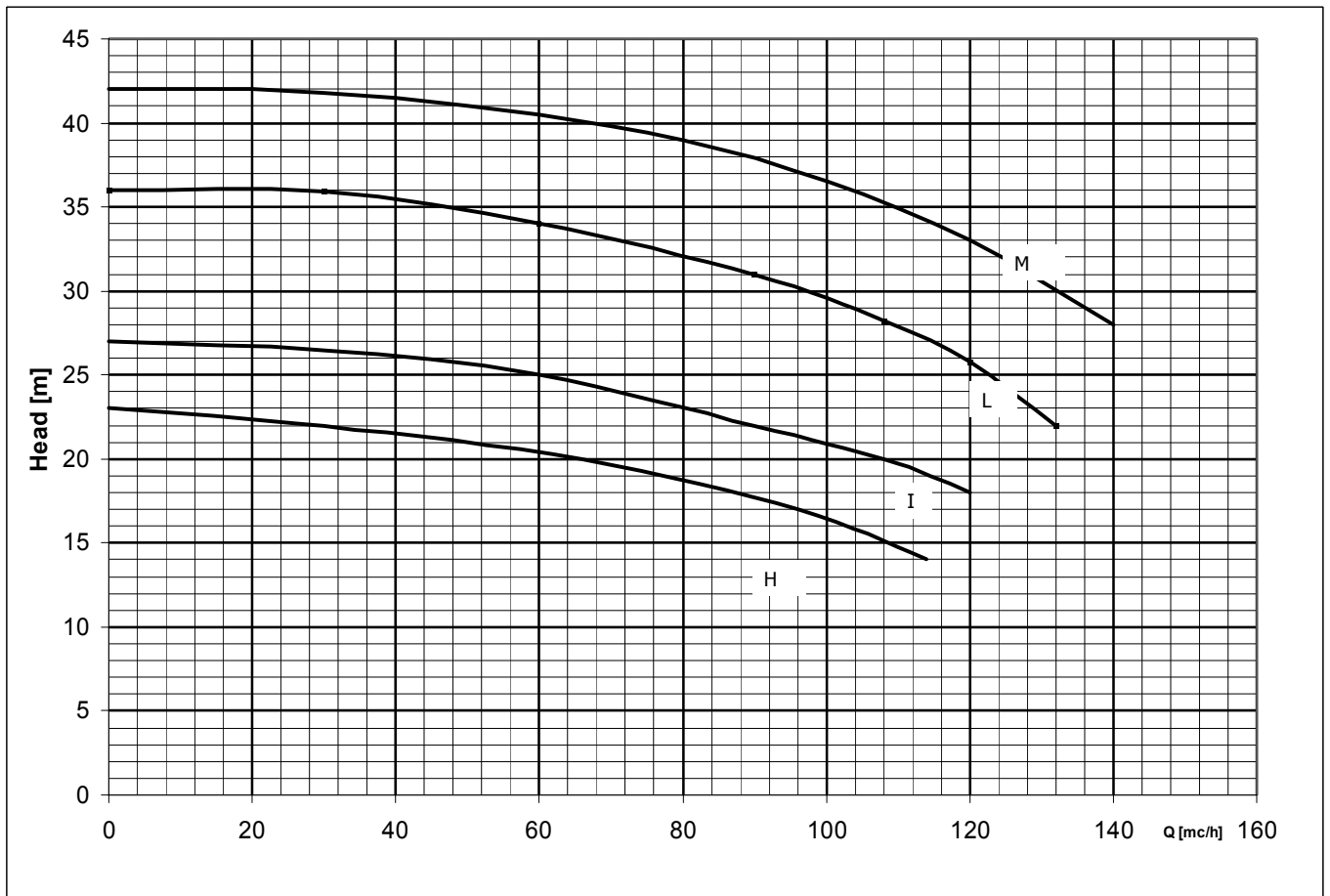
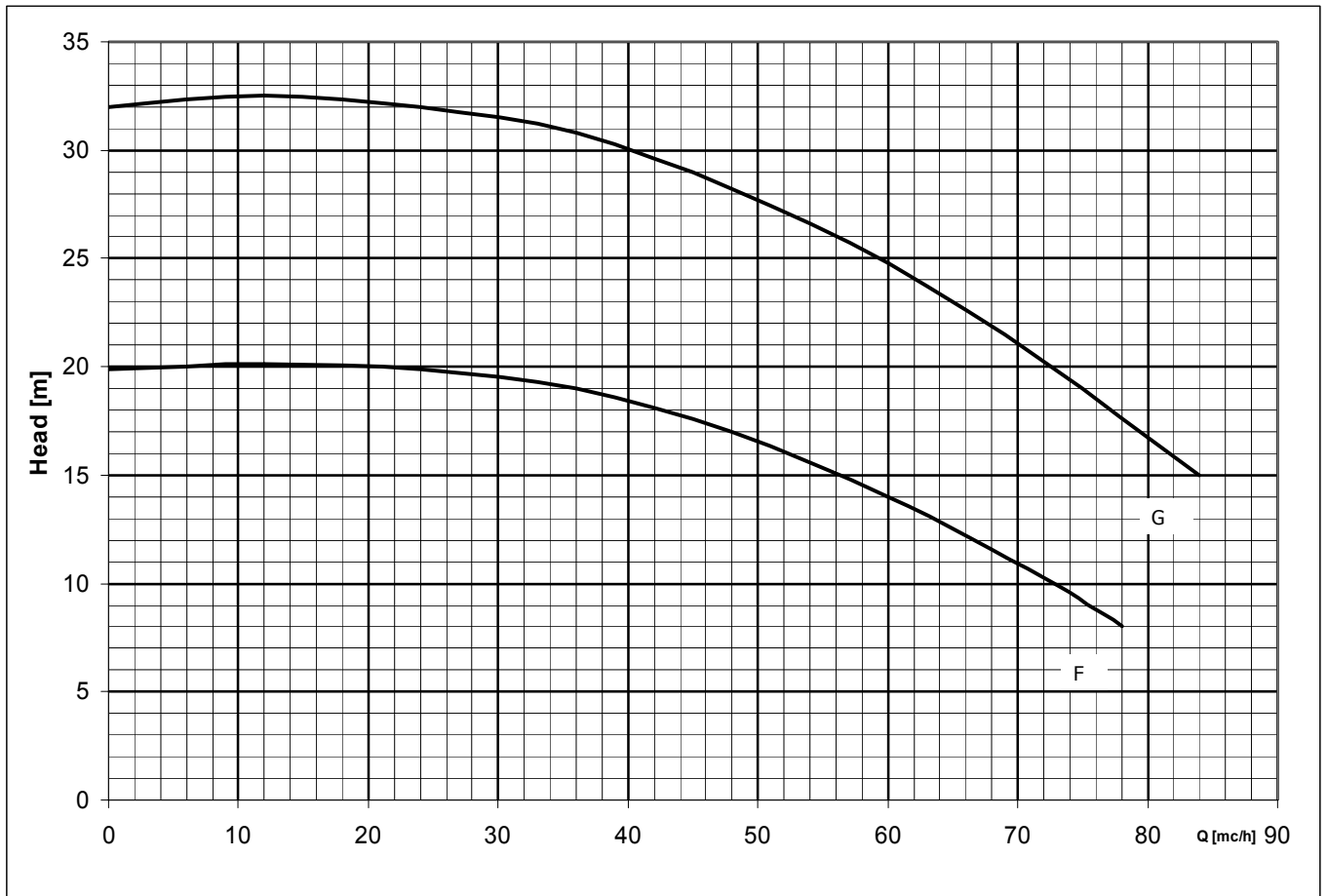
Maintenance checks shall be performed by a competent person according to the schedule here below.

However, it shall be noted that HPT units can not be directly repaired by the User who shall refrain from attempting to repair any failure which may be discovered during daily operation.

OperationS	Daily	Weekly	Monthly	Season start	Season end
Check the operating pressure		■			
Check the electrical absorption			■		
Check the operation of the safety valve				■	
Make sure the insulation is intact				■	
Make sure the screws of terminals are firmly tight				■	
Clean the external surface of the unit with soapy water				■	
Check the concentration of the antifreeze mixture (if an antifreeze mixture is circulating)				■	■
Drain and clean the device					■

18 CHARACTERISTIC CURVES





Errore. L'argomento parametro è sconosciuto.

