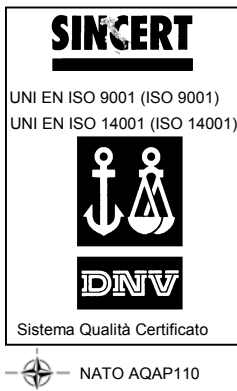




ACS
environmental chambers division
BS
biomedical Division



06056 Massa Martana (PG)
ITALY

e-mail : info@angelantoni.it
fax : ++39 (75) 8955.200
tel : ++39 (75) 8955.1

SERVICE

MANUAL

SHOCK FREEZER

KRYOPLASMA **SF 24 230V**

IMPORTANT

Before using this handbook, carefully the instruction handbook for the customer. This handbook has been written for service engineers who have had specific training on the equipment. The service engineer should have a basic knowledge of low voltage systems as well as small refrigerating systems with a hermetically sealed compressor.

WARNING

The installation and maintenance procedures, including the replacement of the supply cable, must be carried out by qualified personnel. Make sure that the equipment is switched off from the mains supply before removing any protective panel. Any operation on equipment under voltage must be carried out only by specialised personnel only if there is no alternative; in this case always take precautionary measures and use control instruments equipped with insulated probes.

1) LIST OF SPARE PARTS

In this chapter, a series of detailed drawings will be given to allow an easy individuation of the spare parts to be ordered.

1.1) HOW TO ORDER SPARE PARTS

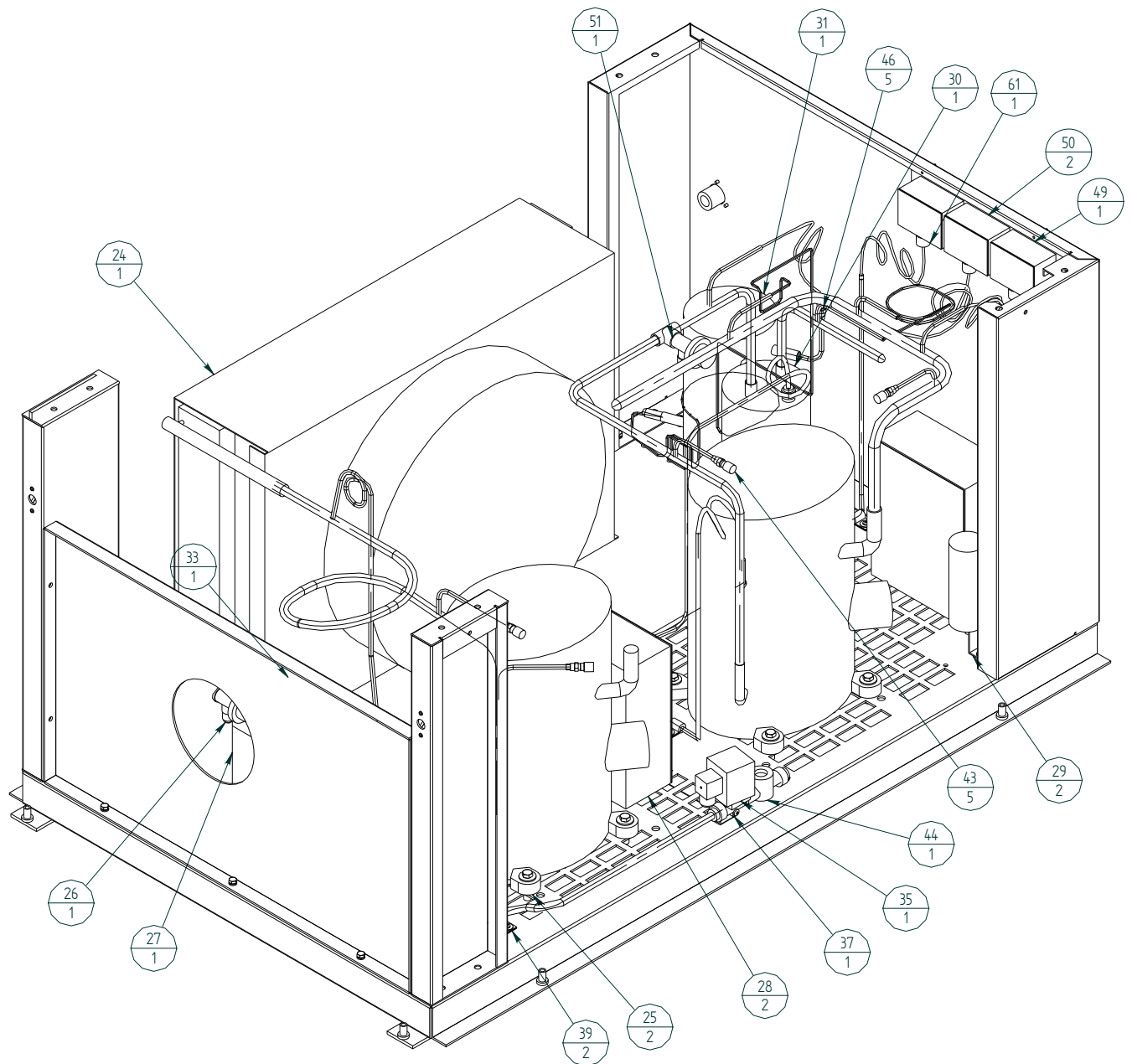
To make the order of spare parts easier, please use the order form given hereinafter.

Angelantoni Industrie spa as - Biomedical division località Cimacolle Massa Martana 06056 Perugia (Italy) tel. (39.75) 8955.1 fax (39.75) 8955.200 SPARE PARTS' ORDER				
Buyer _____ address: _____ _____ _____ Type of equipment: : _____ Part Number: : _____ Year of manufacture: : _____ Please send to the above address the spare parts hereinafter: Means of transport: _____ _____				
Table no.	Ref. no.	Code	Description	Q.ty

ATTENTION:

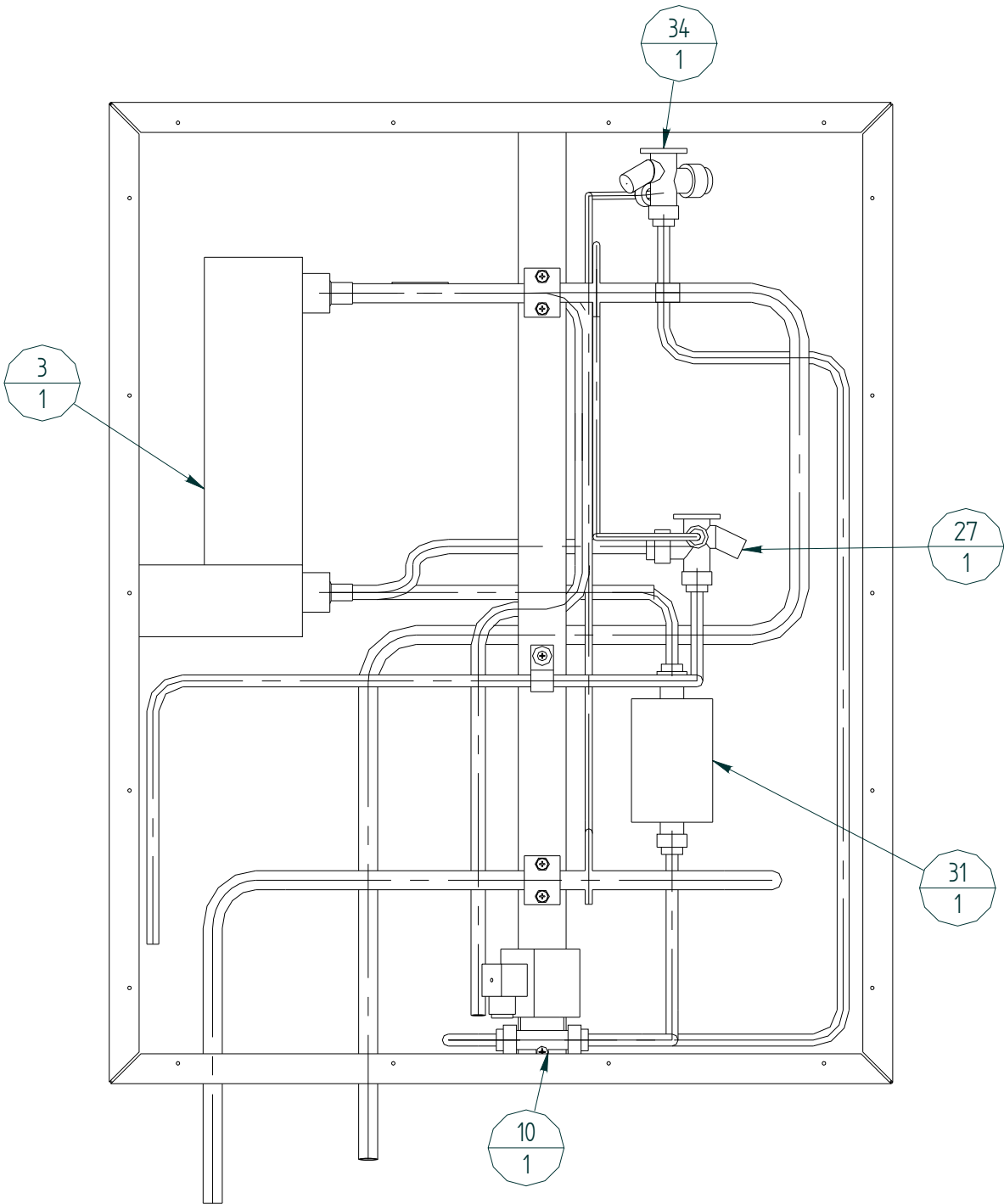
In order to avoid any mistake, we strongly recommend that you reproduce the form above (e.g. by making a copy of it) and fill every part of it (references to tables, etc.) very carefully before sending it back to the manufacturer.

1.2) SPARE PARTS LIST - BASE



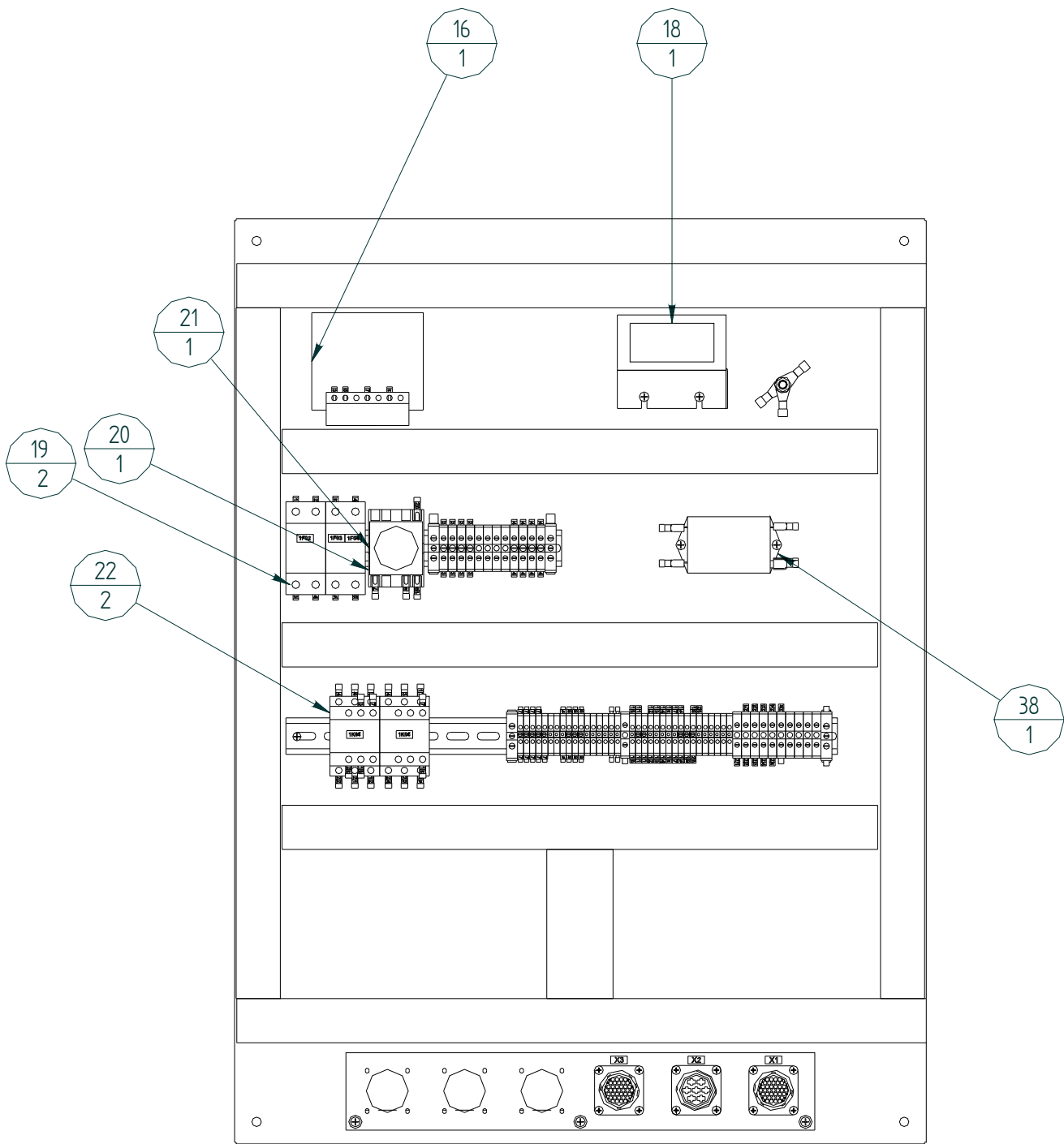
REF. Nr	CODE	DESCRIPTION	CLEANING	REPLACEMENT
24	703042	HIGH STAGE CONDENSER		
25	147010	COMPRESSOR		
26	459937	HIGH STAGE SAFETY VALVE		
27	703043	HIGH STAGE LIQUID TANK		
28		ELECTRIC BOX FOR COMPRESSOR 147010		
29		CONDENSER FOR COMPRESSOR 147010		
30	133570	LOW STAGE OIL SEPARATOR		
31	702805	LOW STAGE GAS TANK		
33	402395	HIGH STAGE DRIER FILTER		
37	700581	SOLENOID VALVE		
43	113595 113590 113610	LOADING VALVE		
44	422480	HIGH STAGE LIQUID INDICATOR		
49	132800	LOW PRESSURE SWITCH		
50	407712	HIGH PRESSURE SWITCH		
51	459697	LOW STAGE SAFETY VALVE		

1.3) SPARE PARTS LIST – INTERMEDIATE EXCHANGER BOX



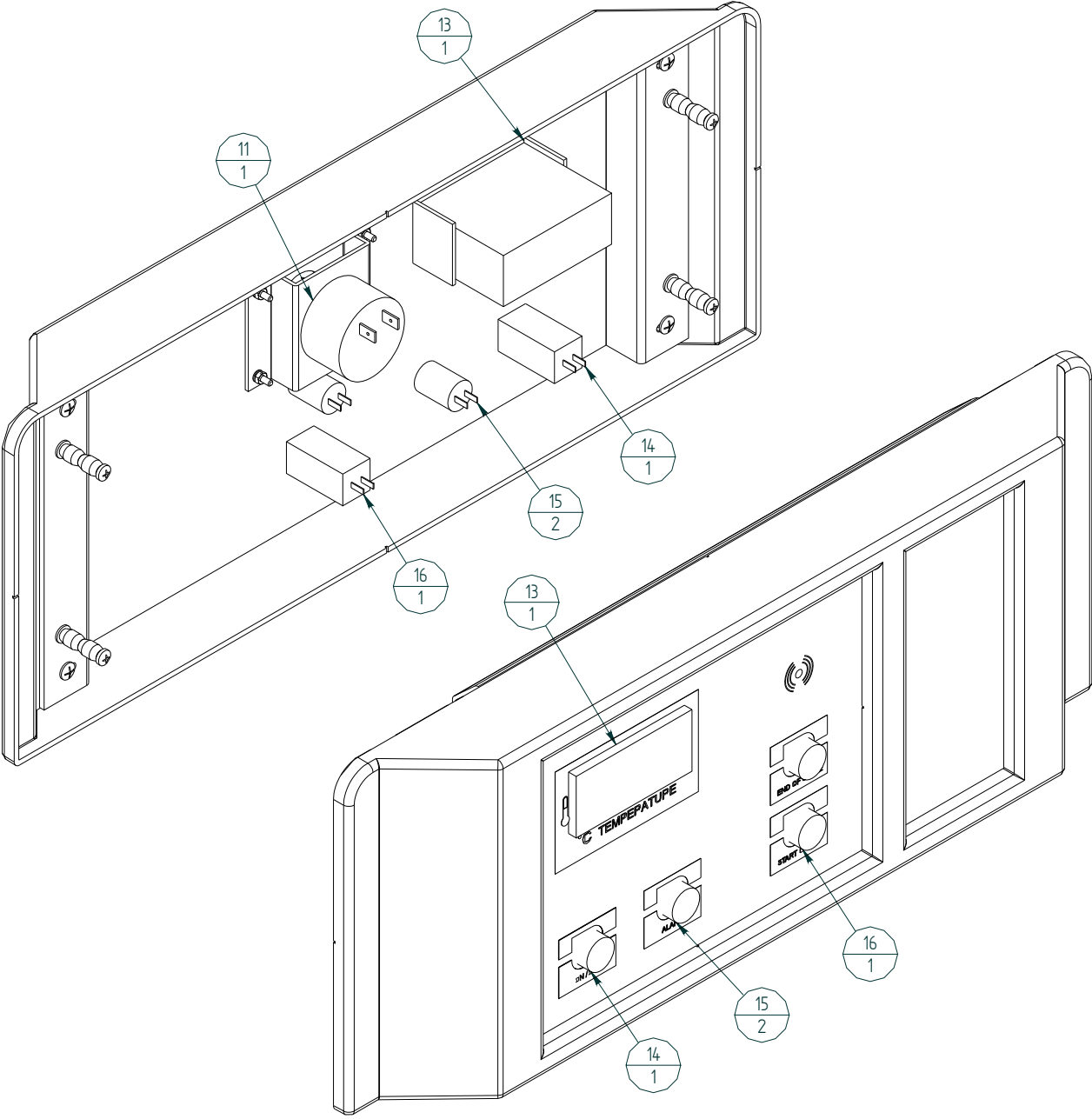
REF. Nr	CODE	DESCRIPTION	CLEANING	REPLACEMENT
3	428109	INTERMEDIATE EXCHANGER		
10	700581	SOLENOID VALVE		
27	701985	HIGH STAGE THERMOSTATIC VALVE		
31	133280	LOW STAGE DRIER FILTER		
34	439510	LOW STAGE THERMOSTATIC VALVE		

1.4) SPARE PARTS LIST – ELECTRICAL POWER BOARD



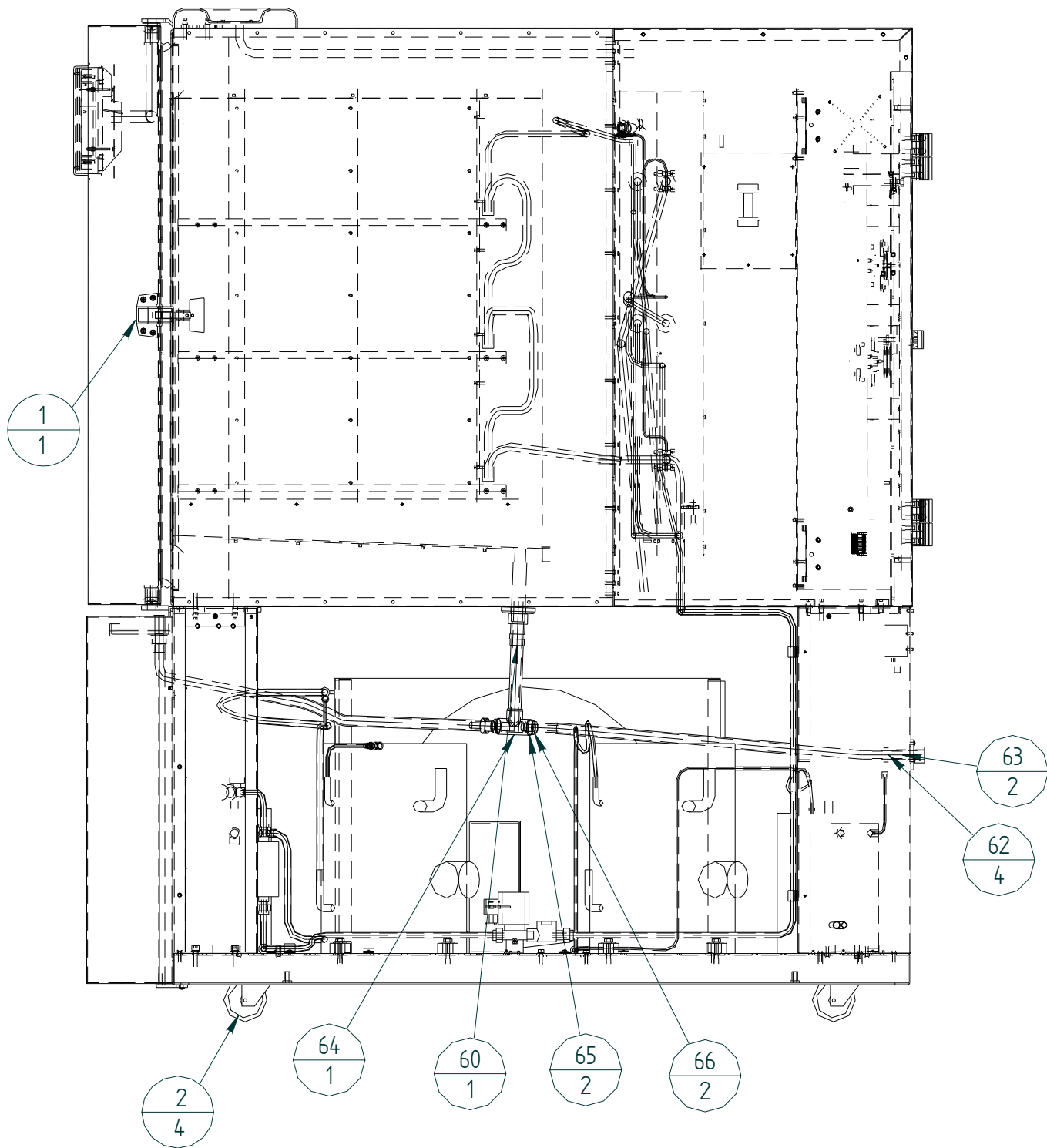
REF. Nr	CODE	DESCRIPTION	CLEANING	REPLACEMENT
16	194800	TRANSFORMER		
18	420110	INTERMEDIATE CONTROLLER		
19	195140	FUSE-HOLDER		
20	191650	TIMER BASE		
21	303552	TIMER		
22	193220	SWITCH		
38	428092	ANTIJAMMING FILTER		

1.5) SPARE PARTS LIST – CONTROL PANEL



REF. Nr	CODE	DESCRIPTION	CLEANING	REPLACEMENT
11	192085	BUZZER		
13	420110	TEMPERATURE CONTROLLER/ INDICATOR		
14	433025	WHITE SWITCH		
15	433027	RED WARNING LAMP		
16	433022	GREEN SWITCH		

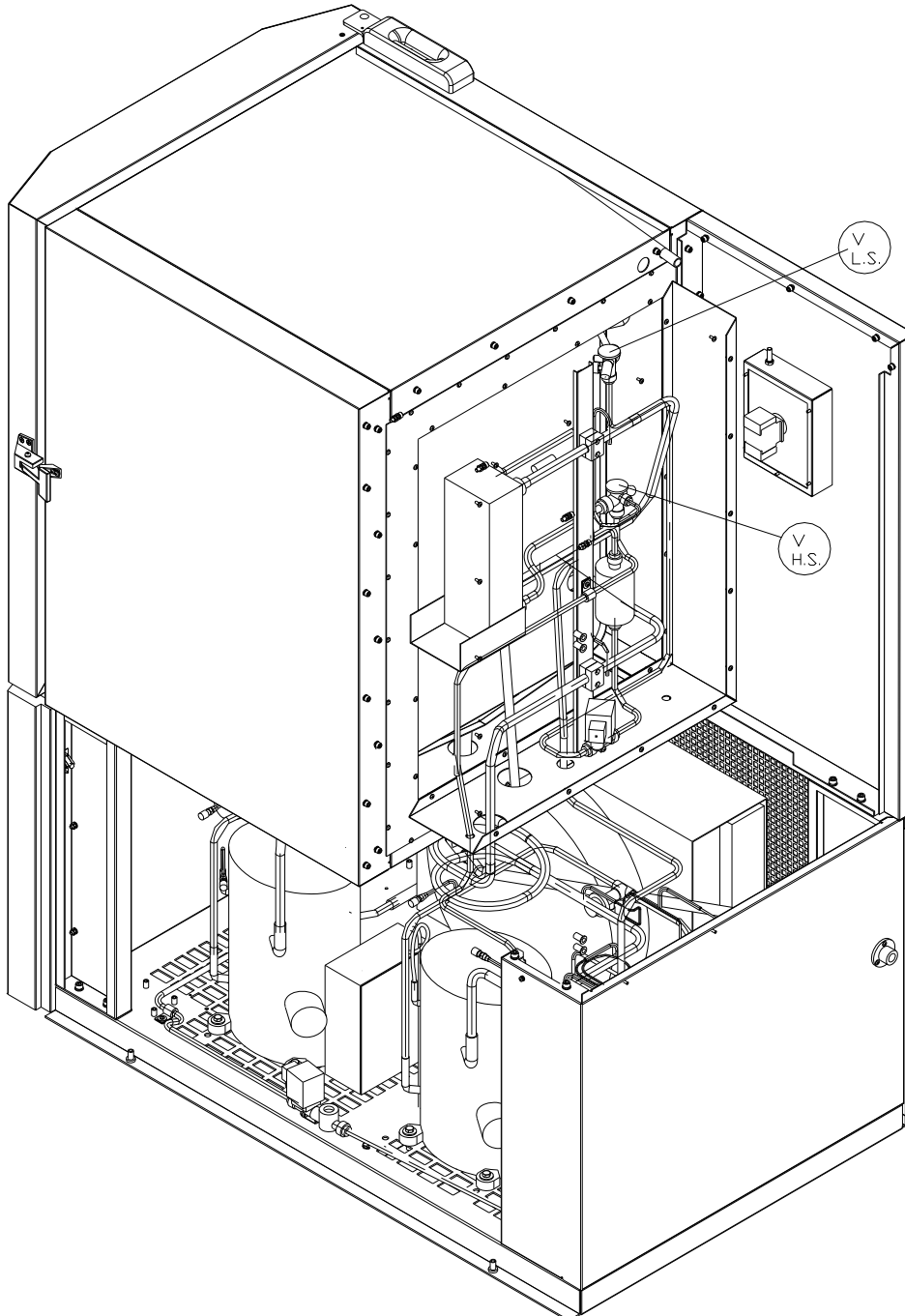
1.6) SPARE PARTS LIST – STRUCTURE



REF. Nr	CODE	DESCRIPTION	CLEANING	REPLACEMENT
1	201140	HANDLE		
2	415870	WHEEL		
60	112445	BRASS CONNECTION FOR CONDENSATE DRAIN		
62	222544	CLAMP FOR CONDENSATE DRAIN		
63	112340	BRASS CONNECTION FOR CONDENSATE DRAIN		
64	281500	PVC CONNECTION FOR CONDENSATE DRAIN		
65	301537	REDUCTION FOR CONDENSATE DRAIN		
66	282300	PVC CONNECTION FOR CONDENSATE DRAIN		

2) SPECIAL TECHNICAL MAINTENANCE INSTRUCTIONS

2.1) ADJUSTMENT OF EXPANSION VALVES



V H.S. = high stage
thermostatic valve
V L.S. = low stage
thermostatic valve

Thermostatic valves don't need adjustment. They are proper for the equipment.

When the valves are correctly working these temperatures should be measured on the suction pipes at 10 cm from compressors (however deviations from the values are possible depending on ambient temperatures and working conditions):

high stage: about -20°C

low stage: about -30°C.

2.2) REFRIGERANT SYSTEM TECHNICAL INFORMATION

- QUANTITY OF REFRIGERANT GAS

High stage: 1,9 Kg R404A

Low stage: 0,8 Kg R23

- CONDENSING TEMPERATURES

(with temperature inside the chamber -75°C and low stage compressor working)

High stage: 10°C ΔT_{amb}

Low stage: -15/-25°C (during start condition and when low stage compressor is not working this value can be different from the indicated range)

- PRESSURE SWITCH CALIBRATION

H.S. high pressure switch: 22 bar - differential 6 bar

L.S. high pressure switch: 22 bar - differential 6 bar

L.S. low pressure switch: 2,2-2,4 bar - differential 0,8 bar

- ALARMS

Alarm warning lamp on the control panel indicates that high pressure switches have stopped compressors as consequence of high pressure on compressor outlet pipe.

3) ELECTRONIC CONTROLLERS PARAMETERS

For description of parameters, see attached electronic controller user manual.

PARAMETER	VALUE FOR INTERMEDIATE CONTROLLER	VALUE FOR CONTROL PANEL CONTROLLER (TEMPERATURE DISPLAY)
set	-20°C	-75°C
HC1	C	C
dF1	20	1
HS1	0	0
LS1	-100	-75
dn1	20	1
do1	0	0
di1	0	0
dE1	0	0
On1	0	0
OF1	1	1
LOC	n	n
PA1	0	0
ndt	n	n
CA1	0	0
dro	C	C
H00	Pt1	Pt1
H10	0	0
rEL	/	/
tAb	/	/
UL	/	/
dL	/	/
Fr	/	/

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ENCLOSED

- ELECTRONIC CONTROLLER IC 912 USER MANUAL