Spare parts - Instructions of use

Replacement of parts and use of non genuine parts

Our products are designed to comply with current EC regulations and guarantee optimal operating conditions with maximum safety conditions for the user.

Any modification of the product made by the user is liable to lead to non-compliance with the regulations, or even to put into doubt the performance of the product and the user's safety.

Replacement of defective components by other parts than genuine parts, and use of these parts, jeopardize the initial safety conditions of the equipment. **In such case, the EC declaration of conformity becomes null: AVTF withdraws his responsability for such operations.**

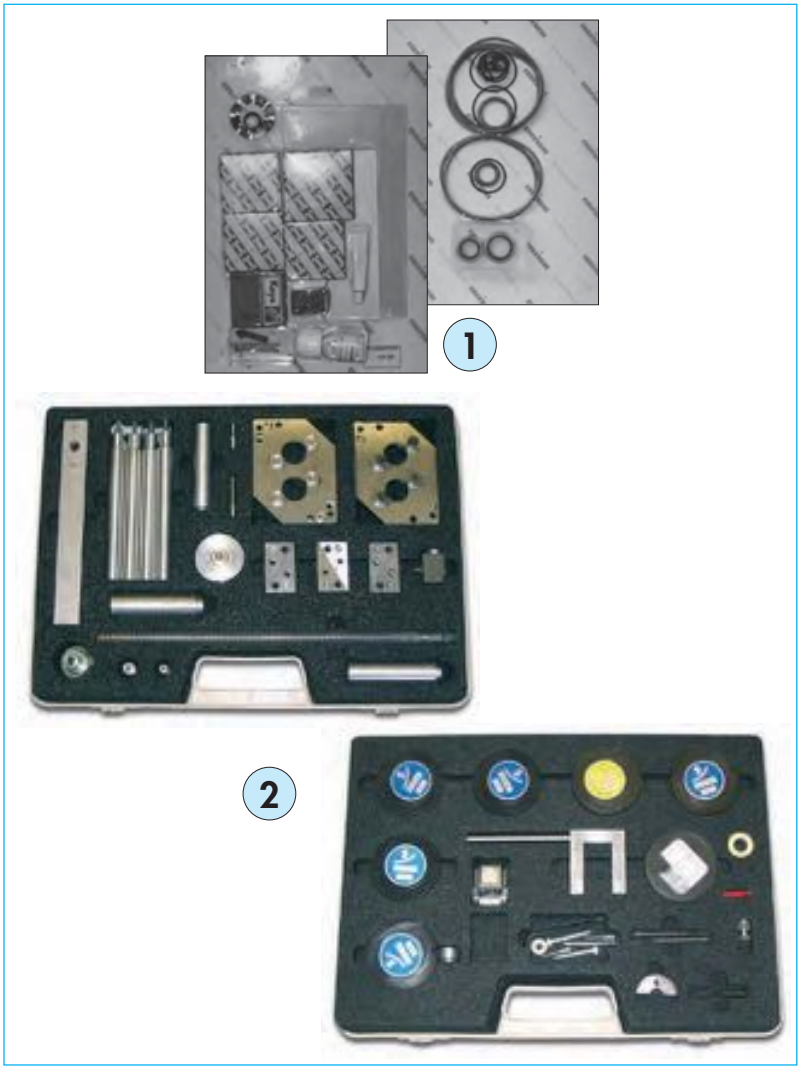
Besides, counterfeiting and unfair trading of parts are condemned under the civil and criminal laws.

AVTF urges the users no to take parts in the use of «imitations», in the misappropriation and pirating of intellectual property performed by some dishonest operators.

AVTF supplies maintencnce components, spare parts or kits to perform the maintenance of its products (see chapter F).

GB 01390 - Edition 01 - February 02

Complete maintenance kit

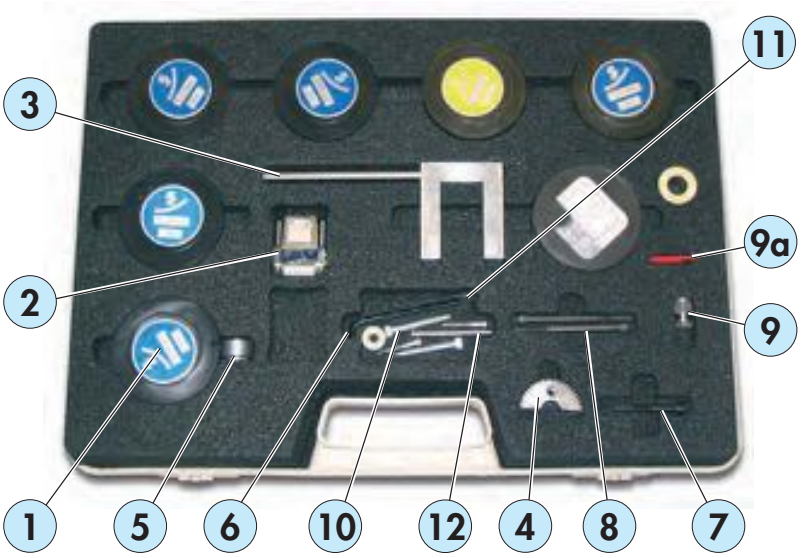


Ref.	Description	P/N ACP28	P/N ACP40
1	Complete maintenance kit: • Seal kit • Maintenance parts	109350	109350
2	Specific tool kit (see detail next page)	104642	104642
	Complete maintenance kit for hydrocarbon or V3SH pump type	109620	

GB 01339 - Edition 02 - August 04

Complete maintenance kit

Toll case P/N 104642



The first stage includes:

Ref.	Description	Qty	P/N
1	Box of shims*		
	• Shim of thickness 0.04 x 12.7	1	**107101**
	• Shim of thickness 0.06 x 12.7	1	**105679**
	• Shim of thickness 0.07 x 12.7	1	**105040**
	• Shim of thickness 0.08 x 12.7	1	**051950**
	• Shim of thickness 0.10 x 12.7	1	**102068**
	• Shim of thickness 0.12 x 12.7	1	**051951**
	• Shim of thickness 0.14 x 12.7**		**108889**
2	Running-in plug ACP 20***	1	-
3	Rotor locking tool*	1	**105349**
4	Gear sector	1	**A461724**
5	Spacer	1	-
6	Shortened hexagonal key	1	-
7	Screw CHc M6-45	2	-
8	Screw CHc M6-80	2	-
9	Obturator (ACP 20 and ACP 28 model)	1	-
9a	Obturator (ACP 20/28 for leak detector model)	1	-
10	Screw CHc M6-60	2	-
11	Allen key for screw hexagonal key (2.5)	2	-
12	Extension for 3 mm hexagonal key	2	-

*The referenced parts can be ordered individually.

**Non pictured in tool case.

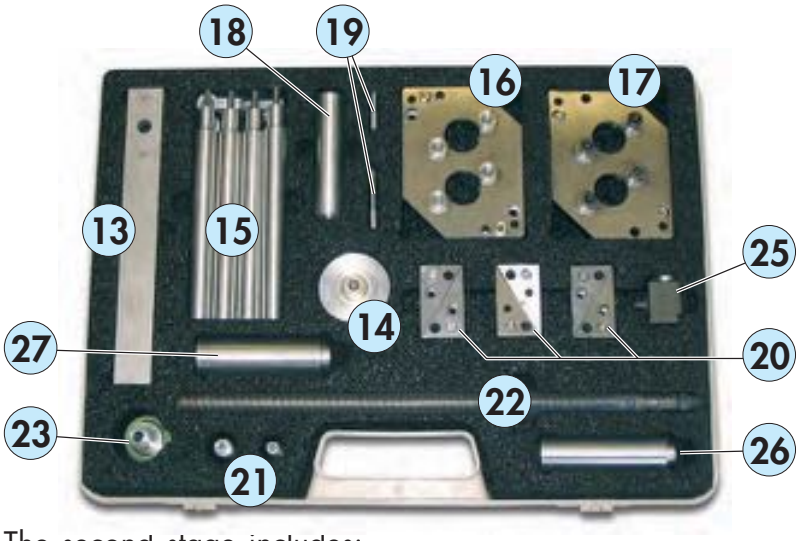
***For ACP 28, use the running-in plug delivered with the pump.

No binding photo

GB 01339 - Edition 02 - August 04

Complete maintenance kit

Toll case P/N 104642 (continued)



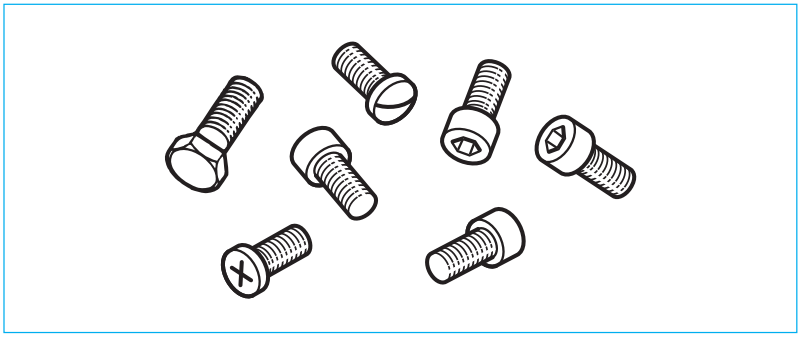
The second stage includes:

Ref.	Description	Qty	P/N
13	Spanner wrench	1	-
14	Spacer (dummy rotor)	1	-
15	Rod	1	-
16	Indexing tool	1	A215209
17	Setting tool 10 m3/h ACP 20/ACP 28	1	A330244
18	Pusher/seal extractor	1	-
19	Large synchronization measuring rod	1	-
	Short synchronization measuring rod	1	-
20	Raising tool (one by model)	3	-
21	Screw CHc M4-30	2	-
	Valve needle support	1	-
	O-ring	1	-
	Plug		
22	PVC tube with nipple	0,4 m	-
23	Nipple DN 25 G1/4 Alu	1	-
	O-ring	1	-
24	Sleeve tool DN 25 ACP 20/ACP 28	1	-
	Sleeve tool DN 20	1	-
25	Key mounting tool	1	A461354
26	Lip seal Ø30 tool	1	A461356
27	Lip seal Ø35 tool	1	A461357
28	Screw CHc M6-20	2	075530

GB 01339 - Edition 02 - August 04

Screw kit - Pin kit - Deflector kit

Scew kit P/N. 109352



Description	Qty
Screw CHc M3-8	10
Screw CHc M3-12	10
Screw CHc M4-12	20
Screw CHc M4-30	10
Screw CHc M4-50	15
Screw CHc M5-16	5
Screw CHc M6-8 (stainless steel)	5
Screw CHc M6-10	10
Screw CHc M6-30	5
Screw CHc M6-45	30
Screw CHc M6-20	5
Screw CHc M6-80	12
Screw HM M6-25	4
Screw FHc M4-12	5

Description	Qty
Screw FHc M4-16	10
Screw FHc M5-12	10
Screw FHc M6-12	5
Screw FS M3-5	5
Screw Hc M5-12	5
Ecrou H M4	5
Screw CBLZ M5-10	5
Spring Washer M6x16x2,6	2
Washer diam Ø 6x19 ep 3	1
Washer M6	10
Washer M5	5
Washer M4	5
Ond. washer	5

Pin kit P/N. 107234

Description	Qty
Worked pin	12

Deflector kit P/N. 110119

Description	Qty
Deflector Ø29	2
Deflector Ø23	2

GB 01340 - Edition 02 - August 04

Parts and materials required for maintenance

Ref.	Description	Qty	P/N
1a	Loctite 542 oil-tight adhesive	1	
1b	Loctite threadlocker low strength 222	1	
2	Vacuum grease	1	
3	Lint-free clean cloth	1	
4	"Latex" gloves	1	
5	Fine abrasive pad or cloth (000)	1	
6	Fomblin** oil A 113 (0.5 l) (**ACP 28/40**)	1	**064657**
	Mineral oil A 120 (1 l) (**ACP 15**)	1	**010990**
7	Solvent*/ Alcohol	2	
	Dry compressed air	1	

* Alcatel recommends the use of a mineral-based solvent in compliance with current legislation.

** MONTEDISON registered trademark.

GB 01412 - Edition 03 - March 05

Recommended standard tools

Basic tools

Ref.	Description	P/N ACP 20	ACP 28	ACP 40	ACP 15
1	Magnet support*	089213	089213	089213	089213
2	Hexagonal keys: 2.5 - 3 - 4 - 5 - 8 mm	✓	✓	✓	✓
3	Grinding stone or fine abrasive cloth (000)	✓	✓	✓	✓
4	Open-end wrenches 6, 10, 15, 17, 23 and 30 mm	✓	✓	✓	✓
5	Dial gauge* (1/100)	089214	089214	089214	089214
6	Socket wrenchset series 10 to 24 mm (Facom R.426 EP)	✓	✓	✓	✓
7	Torque screwdriver 2 to 10 Nm (Facom A304 A)	✓	✓	✓	✓
8	Torque wrench 5 to 20 Nm (Facom R302 A)	✓	✓	✓	✓
9	Puller Facom Length 180 mm (Facom U42B)	✓	✓	✓	✓
10	Multigrip plier (not pictured)	✓	✓	✓	✓
	Drift punch diam 2.9 (Facom 2493)				✓

*The referenced parts can be ordered individually.

Workshop tools Work bench, bench screw

GB 00345 - Edition 04 - March 05

M

Spare parts

ACP 28 Functional block
spare part list..... F 60

ACP 28 - ACP 40 - ACP 40 G
rotor spare part list ..... F 61

Motor/variator
spare part list..... F 62

ACP 40 functional block
spare part list..... F 65

ACP 28 G specific
spare part list..... F 70

ACP 40 G specific
spare part list..... F 75

ACP 28 for leak detection
spare part list..... F 80

Silencer
spare part list..... F 90

Cover
spare part list..... F 100

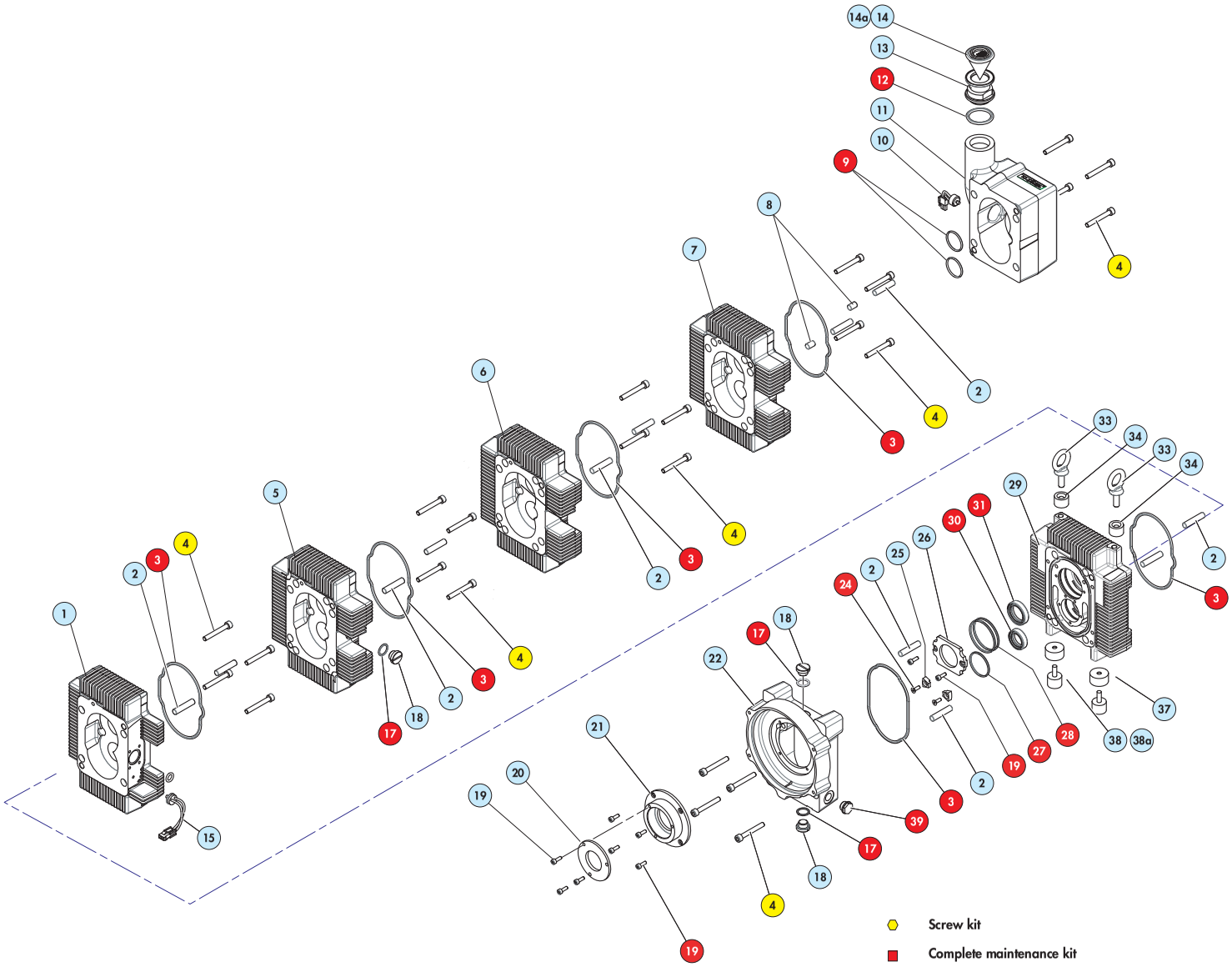
GB 01341 - Edition 02 - August 04

F 60

ACP 28 functional block spare part list

Ref.	Description	Qty*	P/N
1	Exhaust stator	1/1	A110541
2	Centering pin	2/12	060268
3	O-ring C3 Ø101	1/6	■
4	Screw CHc M6-45	4/25	⬡
5	Transfer stator HP	1/1	A110539
6	Transfer stator BP2	1/1	A110538
7	Transfer stator BP1	1/1	A110537
8	Centering pin Ø8 x 12	2/2	071046
9	O-ring C2 Ø27	2/2	■
10	Temperature sensor (cold)	1/1	A460182
11	Inlet stator	1/1	A110700
12	O-ring DN25 (black) C3,6 D29,3	1/1	■
13	Inlet fitting DN25	1/1	065819
14	Conical inlet filter DN25 - 250 µm	1/1	A461949
14a	O-ring DN25	1/1	■
15	Temperature sensor (hot)	1/1	A462231
17	O-ring C1,78 Ø14	1/3	■
18	Plug	3/3	052181
19	Screw CHc M4-12	9/9	■
20	Bearing flange	1/1	102946
21	Bearing housing	1/1	102945
22	Oil casing	1/1	A111107
24	Screw FHc M4-12	2/2	■ ⬡
25	Flange sector	2/2	104024
26	Bearing flange	1/1	A328969
27	O-ring C2 Ø35	1/1	■
28	O-ring C2 Ø47	2/2	■
29	Bearing bloc support	1/1	A110986S
30	Double lip seal 20 x 30 x 8	1/1	■
31	Double lip seal 25 x 35 x 8	1/1	■
33	Hoisting ring	2/2	107220
34	Spacer for hoisting ring	2/2	A459748
37	Spacer for damper	2/2	A459003
38	Damper	2/2	107160
38a	Spacer washer	2/2	A461901
39	Oil level sight glass	1/1	■

(*) Quantity / Total quantity



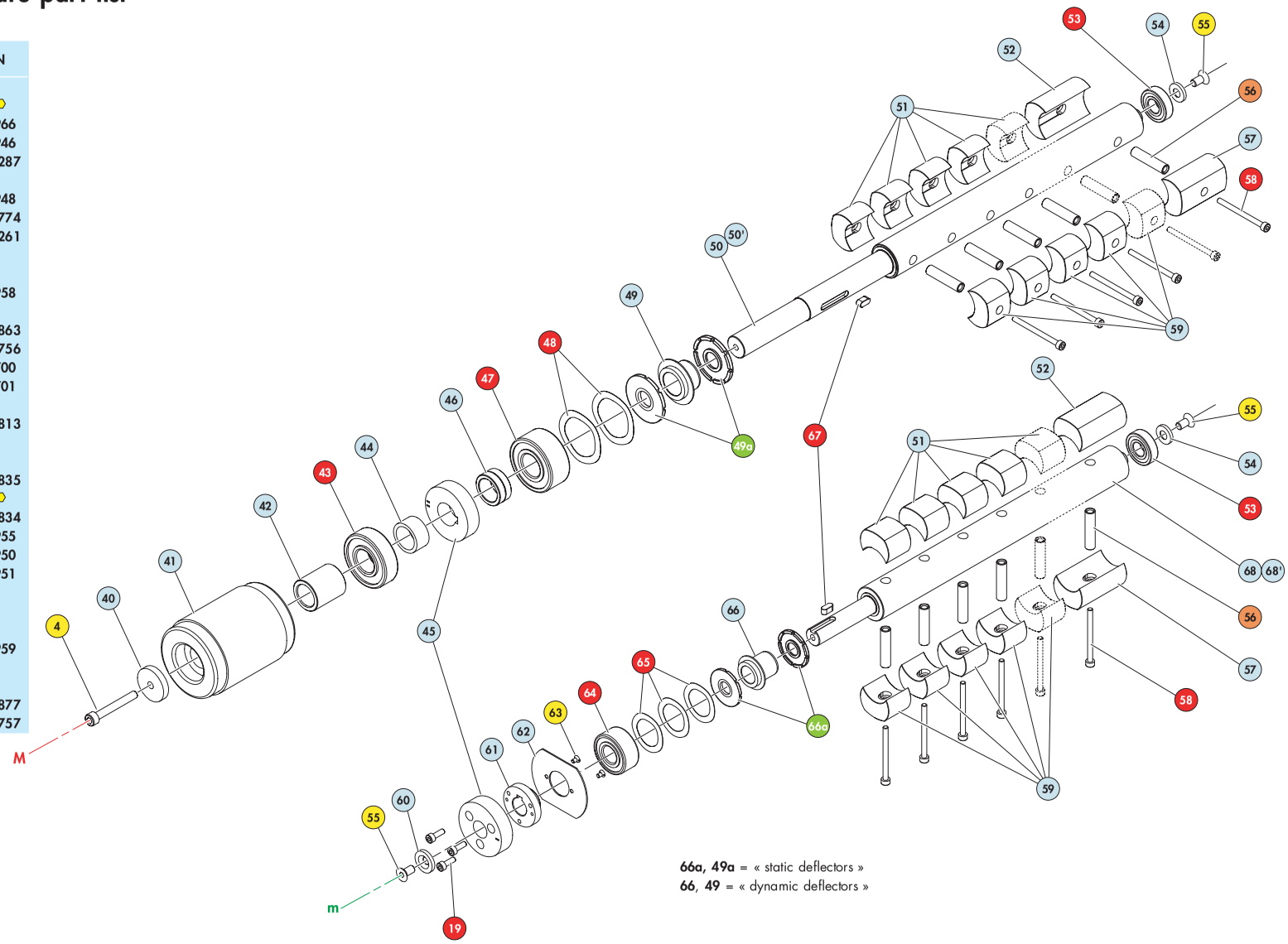
GB 01342 - Edition 02 - August 04

F 61

ACP 28 - ACP 40 - ACP 40 G
rotor spare part list

Ref.	Description	Qty* ACP 40	Qty* ACP 28	P/N
4	Screw CHc M6-45	1/25		⬡
19	Screw CHc M4-12	3/12		■ ⬡
40	Motor rotor washer	1/1		102966
41	Motor	1/1		108946
42	Motor spacer	1/1		A460287
43	Roller bearing	1/1		■
44	Spacer	1		102948
45	Set of 2 gear	1/1		A329774
46	Driving gear ring	1/1		A329261
47	Bearing 5204	1/1		■
48	Spring washer	2/2		■
49	Deflector Ø39	1/1		102958
49a	Deflector Ø29	2/2		▲
50	Driving shaft ACP 28	—	1/1	A214863
50'	Driving shaft ACP 40	1/1	—	A214756
51	Threaded lobe 10 m3	10/10	8/8	106700
52	Threaded lobe 20 m3	2/2		106701
53	Ball bearing 6001	2/2		■
54	Countersunk washer M6x16	2/2		A458813
55	Screw FHc M6-12	3/3		⬡
56	Worked pin	12/12	10/10	●
57	Worked lobe 20 m3	2/2		A458835
58	Screw CHc M4-50	12/12	10/10	■ ⬡
59	Worked lobe 10 m3	10/10	8/8	A458834
60	Washer Ø19	1/1		102955
61	Driven gear ring	1/1		102950
62	Lubrification plate	1/1		102951
63	Screw FS M3-5	2/2		⬡
64	Ball bearing 5202	1/1		■
65	Spring washer	3/3		■
66	Deflector Ø29	1/1		102959
66a	Deflector Ø23	2/2		▲
67	Parallel key 5 x 5 x 11	2/2		■
68	Driven shaft ACP 28	—	1/1	A214877
68'	Driven shaft ACP 40	1/1	—	A214757

(*) Quantity / Total quantity



— · — Driving shaft (M)

— ·-·- — Driven shaft (m)

⬡ Screw kit

■ Complete maintenance kit

● Pin kit

▲ Deflector kit

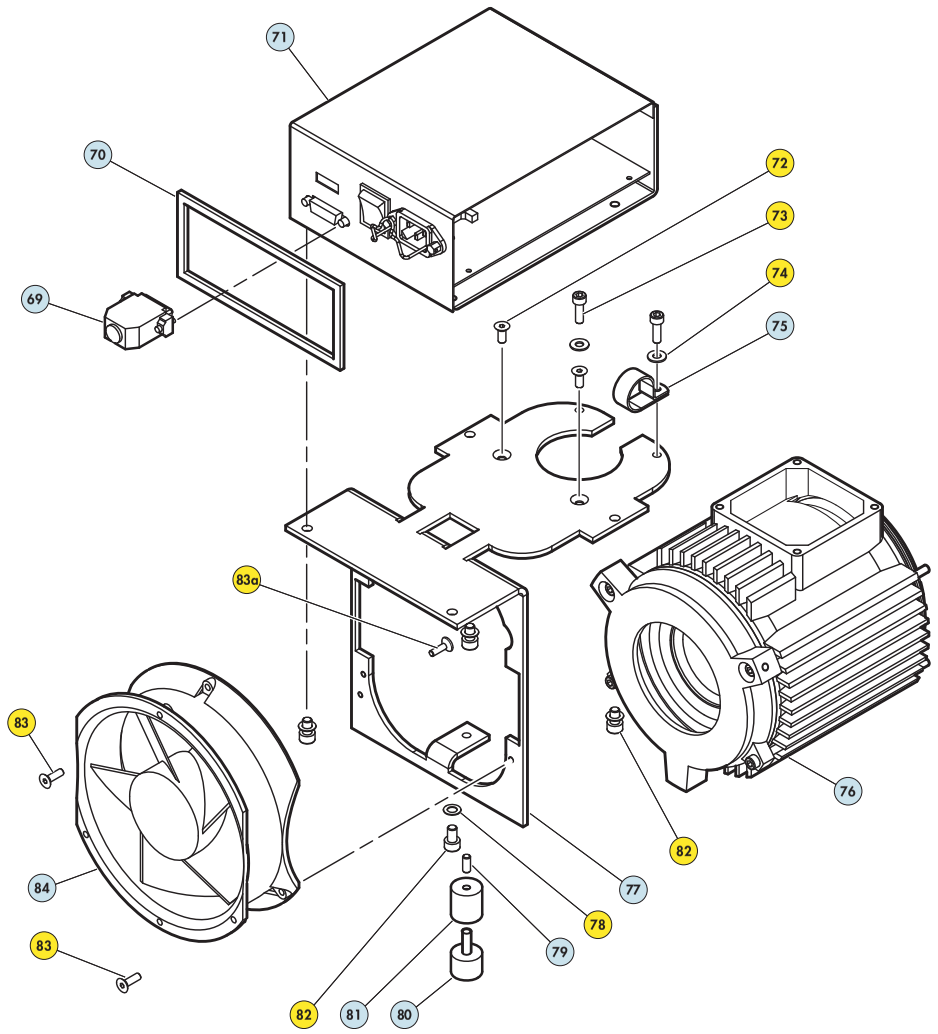
GB 01343 - Edition 02 - August 04

F 62

Motor / variator spare part list

Ref.	Description	Qty*	P/N
69	Variator cover plug	1/1	**A460666**
70	Variator gasket OEM	1/1	**A329486**
71	Variator ACP 28	1/1	**P0342E1**
	Variator ACP 40	1/1	**P0342E4**
72	Screw FHc M5-12	2/2	⬡
73	Screw CHc M5-16	2/2	⬡
74	Washer M5	2/2	⬡
75	Cable clamp	1/1	**109247**
76	3Ø motor (air cooled) ACP28	1/1	**108946**
77	Motor support	1/1	**A110488**
78	Ond. washer Ø6	4/4	⬡
79	Screw Hc M5-12	1/1	⬡
80	Damper	1/1	**107160**
81	Motor support	1/1	**A459728**
82	Screw CHc M6-10	4/4	⬡
83	Screw FHc M4-16	3/3	⬡
83a	Screw CHc M4-12	1/1	⬡
84	Equipped 24 V fan	1/1	**109022**
85	Washer M4	1/1	⬡
-	Ground wire	1/1	**A460609**
-	Wiring harness	1/1	**A329264**

⬡ **Screw kit**



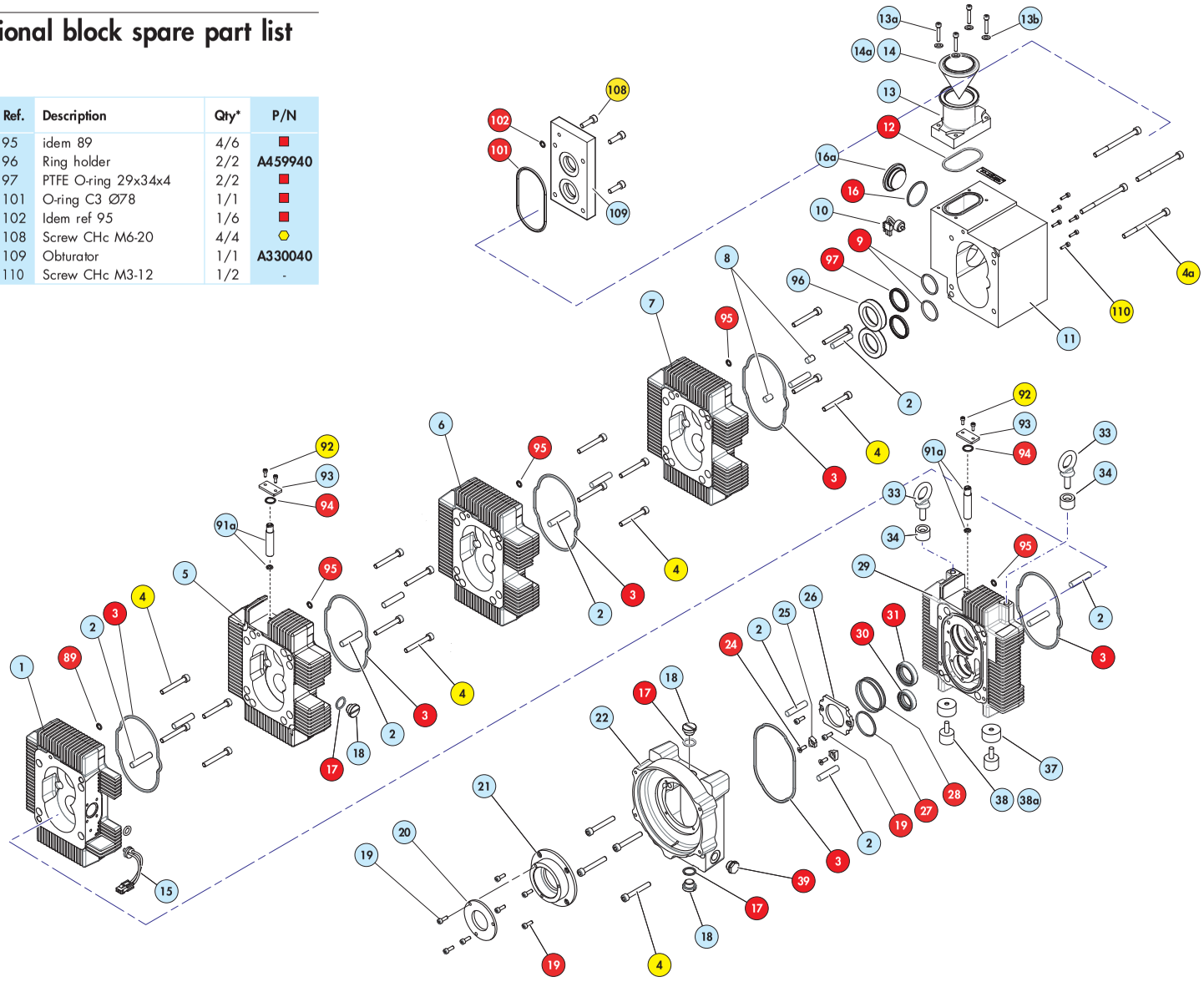
GB 01344 - Edition 02 - August 04

F 65

ACP 40 functional block spare part list

Ref.	Description	Qty*	P/N
1	Exhaust stator	1/1	A110541
2	Centering pin Ø8 x 37	2/12	060268
3	O-ring C3 Ø101	1/6	■
4	Screw CHc M6-45	4/21	⬡
4a	Screw CHc M6-80	4/4	⬡
5	Transfer stator HP	1/1	A110539
6	Transfer stator BP2	1/1	A110538
7	Transfer stator BP1	1/1	A110537
8	Centering pin Ø8 x 12	2/2	071046
9	O-ring C2 Ø27	2/3	■
10	Temperature sensor (cold)	1/1	A460182
11	Inlet stator	1/1	A111183
12	O-ring C2 Ø47	1/1	■
13	Inlet fitting DN 40	1/1	A330027
13a	Screw CHc M4 x 25	4/4	082716
13b	Ond. washer	4/4	073458
14	Conical inlet filter DN 40 - 250 µm	1/1	A462174
14a	O-ring DN40	1/1	■
15	Temperature sensor (hot)	1/1	A462231
16	O-ring C3,6 Ø29,3	1/1	■
16a	Obturator	1/1	065821
17	O-ring C1,78 Ø14	1/3	■
18	Plug	3/3	052181
19	Screw CHc M4-12	9/9	■
20	Bearing flange	1/1	102946
21	Bearing housing	1/1	102945
22	Oil casing	1/1	A111107
24	Screw FHc M4-12	2/2	■ ⬡
25	Flange sector	2/2	104024
26	Bearing flange	1/1	A328969
27	O-ring C2 Ø35	1/1	■
28	Idem ref 12	2/2	■
29	Bearing block support	1/1	A110987S
30	Double lip seal 20 x 30 x 8	1/1	■
31	Double lip seal 25 x 35 x 8	1/1	■
33	Hoisting ring	2/2	107220
34	Spacer for hoisting ring	2/2	A459748
37	Spacer for damper	2/2	A459003
38	Damper	2/2	107160
38a	Spacer washer	2/2	A461901
39	Oil level sight glass	1/1	■
89	O-ring C1,5 Ø5,9	6/6	-
91a	Equipped plug	2/2	A461350
92	Screw CHc M3 x 8	4/4	⬡
93	Purge cover	2/2	A459917
94	O-ring C1,5 Ø11	2/2	■

Ref.	Description	Qty*	P/N
95	idem 89	4/6	■
96	Ring holder	2/2	A459940
97	PTFE O-ring 29x34x4	2/2	■
101	O-ring C3 Ø78	1/1	■
102	Idem ref 95	1/6	■
108	Screw CHc M6-20	4/4	⬡
109	Obturator	1/1	A330040
110	Screw CHc M3-12	1/2	-



(*) Quantity / Total quantity

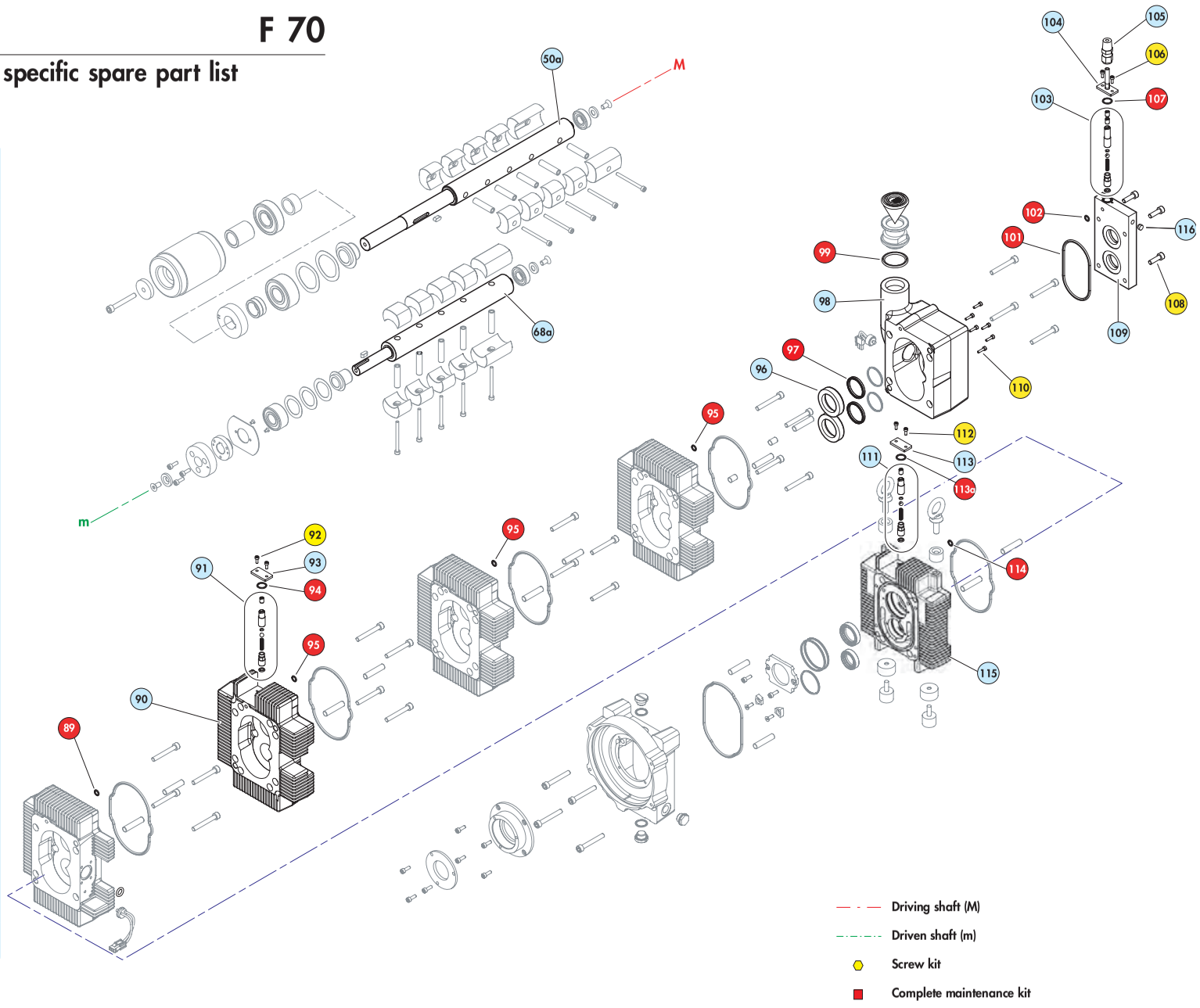
M

F 70

ACP 28 G specific spare part list

Ref.	Description	Qty*	P/N
50a	Driving shaft ACP 28 G	1/1	**A214864**
68a	Driven shaft ACP 28 G	1/1	**A214878**
89	O-ring C1,5 Ø5,9	1/6	■
90	Transfer stator HP	1/1	**A110702**
91	Equipped anti-suckback valve:	1/2	**109354**
	O-ring 2 x Ø4,5		■
	Spring support		-
	Spring		-
	Stainless steel ball Ø5,8		-
	O-ring C1 Ø4		■
	Short anti-suckback		-
	Jet Ø0,3		-
92	Screw CHc M3-8	2/6	⬣
93	Purge cover	1/2	**A459917**
94	O-ring C1,5 Ø11	1/3	■
95	idem ref 89	3/6	-
96	Centering ring	2/2	**A459940**
97	PTFE O-ring 29x34x4	2/2	■
98	Inlet stator	1/1	**A110701**
99	O-ring C3,6 Ø29,3	1/1	■
101	O-ring C3 Ø78	1/1	■
102	idem ref 89	1/6	-
103	Equipped anti-suckback valve:	1/1	**109473**
	O-ring 2 x Ø4,5		■
	Spring support		-
	Spring		-
	Stainless steel ball Ø5,8		-
	O-ring C1 Ø4		■
	Long anti-suckback valve		-
	Jet Ø0,08		-
104	Purge inlet	1/1	**A329250**
105	Connector	1/1	**103211**
106	idem ref 92	2/6	-
107	idem ref 94	1/3	-
108	Screw CHc M6-20	4/4	⬣
109	Injecting plate	1/1	**A329301**
110	Screw CHc M3-12	6/6	⬣
111	idem ref 91	1/2	-
112	idem ref 92	2/6	-
113	idem ref 93	1/2	-
113a	idem ref 94	1/3	-
114	idem ref 89	1/6	-
115	Bearing block support ACP 28 G	1	**A1109875**
116	Plug 1/8 NPT	1/1	**082926**

(*) Quantity / Total quantity



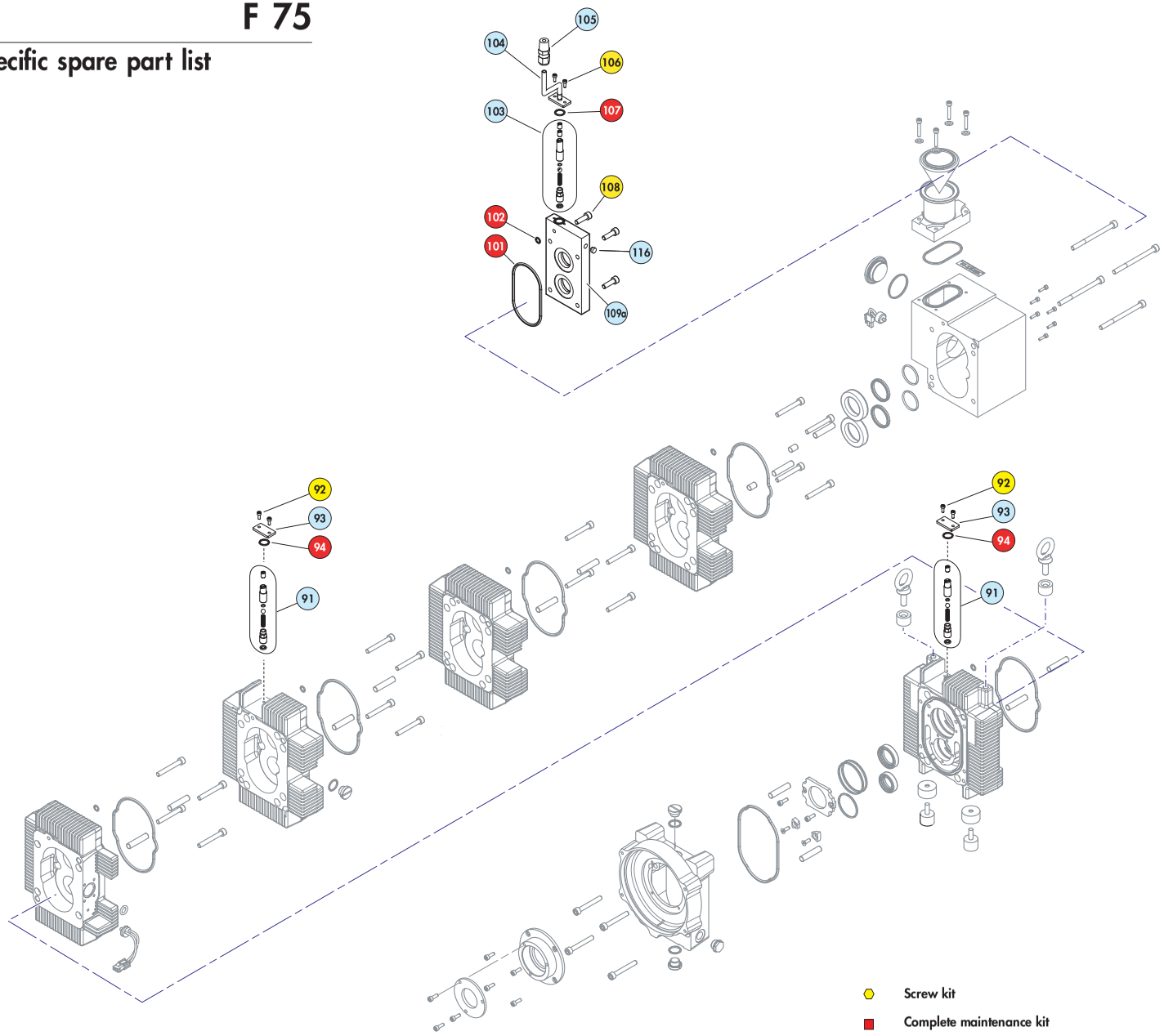
GB 01345 - Edition 02 - August 04

F 75

ACP 40 G specific spare part list

Ref.	Description	Qty*	P/N
91	Equipped anti-suckback valve:	1/2	**109354**
	O-ring 2 x Ø4.5		■
	Spring support		-
	Spring		-
	Stainless steel ball Ø5.8		-
	O-ring C1 Ø4		■
	Short anti-suckback		-
	Jet Ø0.3		-
92	Screw CHc M3-8	4/4	⬢
93	Purge cover	2/2	**A459917**
94	O-ring C1,5 Ø11	2/3	■
101	O-ring C3 Ø78	1/1	■
102	O-ring C1.5 Ø5.9	1/1	■
103	Equipped anti-suckback valve:	1/1	**109473**
	O-ring 2 x Ø4,5		■
	Spring support		-
	Spring		-
	Stainless steel ball Ø5.8		-
	O-ring C1 Ø4		■
	Long anti-suckback valve		-
	Jet Ø0.08		-
104	Purge inlet	1/1	**A329250**
105	Connector	1/1	**103211**
106	idem ref 92	2/6	-
107	idem ref 94	1/3	-
108	Screw CHc M6-20	4/4	⬢
109a	Injecting plate	1/1	**A329301**
116	Plug 1/8 NPT	1/1	**082926**

(*) Quantity / Total quantity



GB 02561 - Edition 01 - August 04

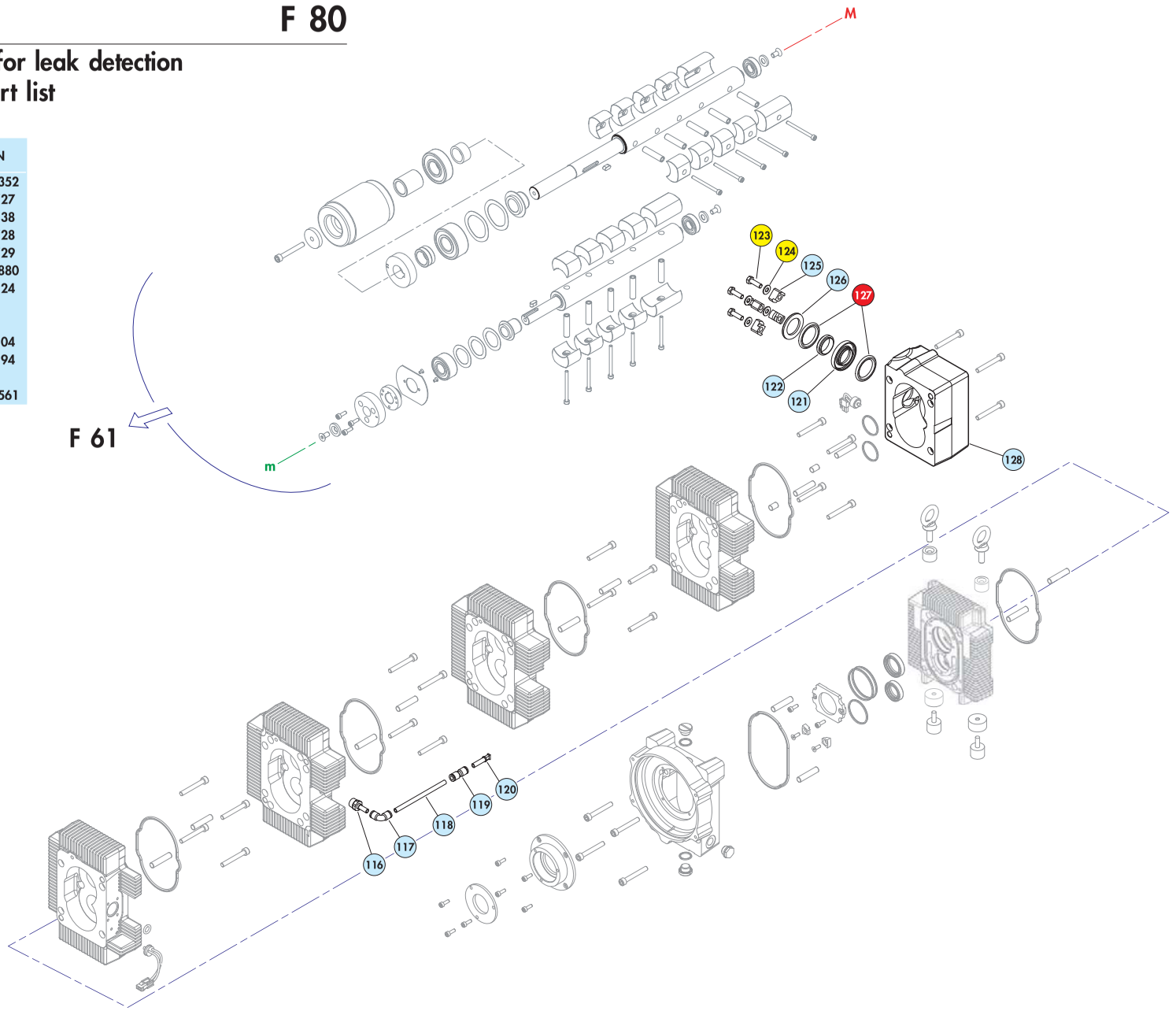
M

F 80

ACP 28 for leak detection spare part list

Ref.	Description	Qty*	P/N
116	Right adaptator connector	1/1	**A459352**
117	Equipped connector	1/1	**107727**
118	Rilsan pipe	1/1	**103638**
119	Connector F/F	1/1	**107728**
120	Plug connector	1/1	**107729**
121	Adaptator ACP 28	1/1	**A460880**
122	Centering ring DN25	1/1	**068224**
123	Screw H M6-25	4/4	⬡
124	Washer M6	4/4	⬡
125	Clamp	4/4	**068504**
126	Blank-off flange DN25	1/1	**068594**
127	O-ring DN25	2/2	■
128	Inlet stator	1/1	**A110561**

(*) Quantity / Total quantity



— · — Driving shaft (M)

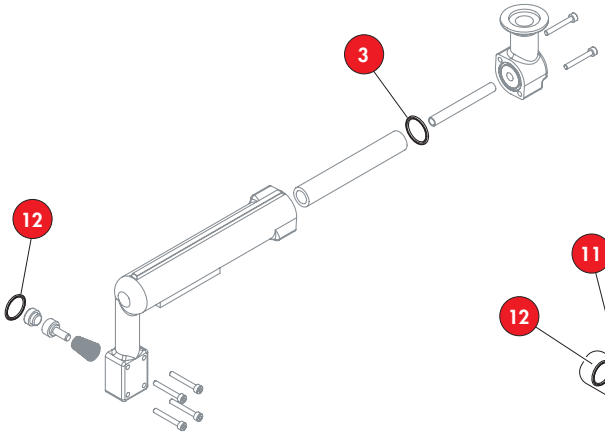
— ·· — Driven shaft (m)

⬡ Screw kit

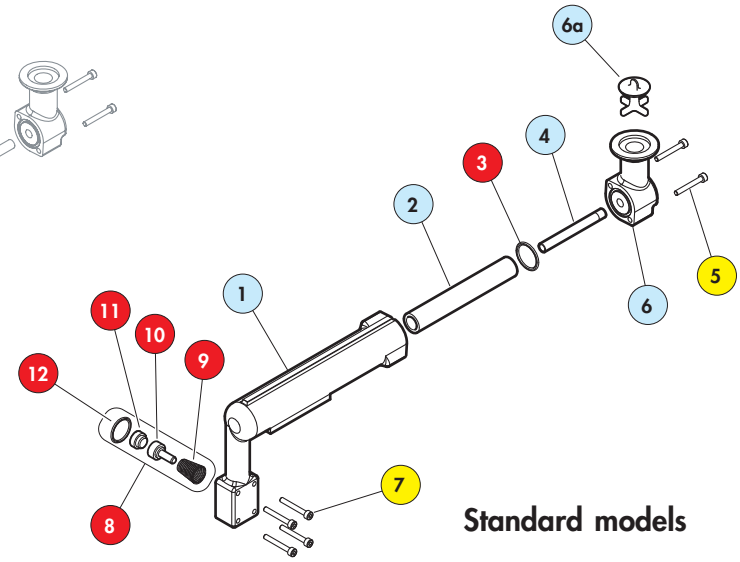
■ Complete maintenance kit

GB 01346 - Edition 02 - August 04

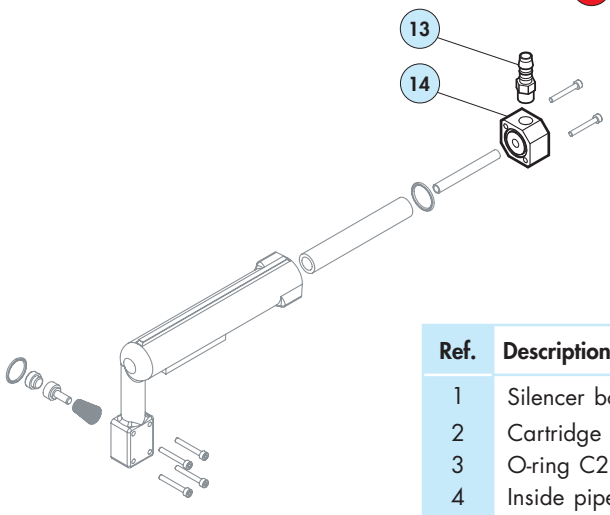
Silencer spare part list



G models



Standard models



ACP 28 for leak detection

Screw kit

Complete maintenance kit

Ref.	Description	Qty*	P/N
1	Silencer body	1/1	**111262**
2	Cartridge	1/1	**A459042**
3	O-ring C2 Ø21*	1/1	■
4	Inside pipe	1/1	**A459857**
5	Screw CHc M4-30	2/6	⬣
6	Flange	1/1	**A329151**
6a	Exhaust valve (ACP 28 /40)	1/1	**065791**
7	Idem ref. 5	4/6	-
8	Valve	1/1	**111261**
9	- Conical spring	1/1	■
10	- Valve support	1/1	■
11	- Valve	1/1	■
12	- O-ring C1,78 Ø18,77**	1/1	■
13	Connector	1/1	**076790**
14	Silencer flange	1/1	**A329323**

* Quantity / Total quantity

**Black for standard and detection models, green for G models

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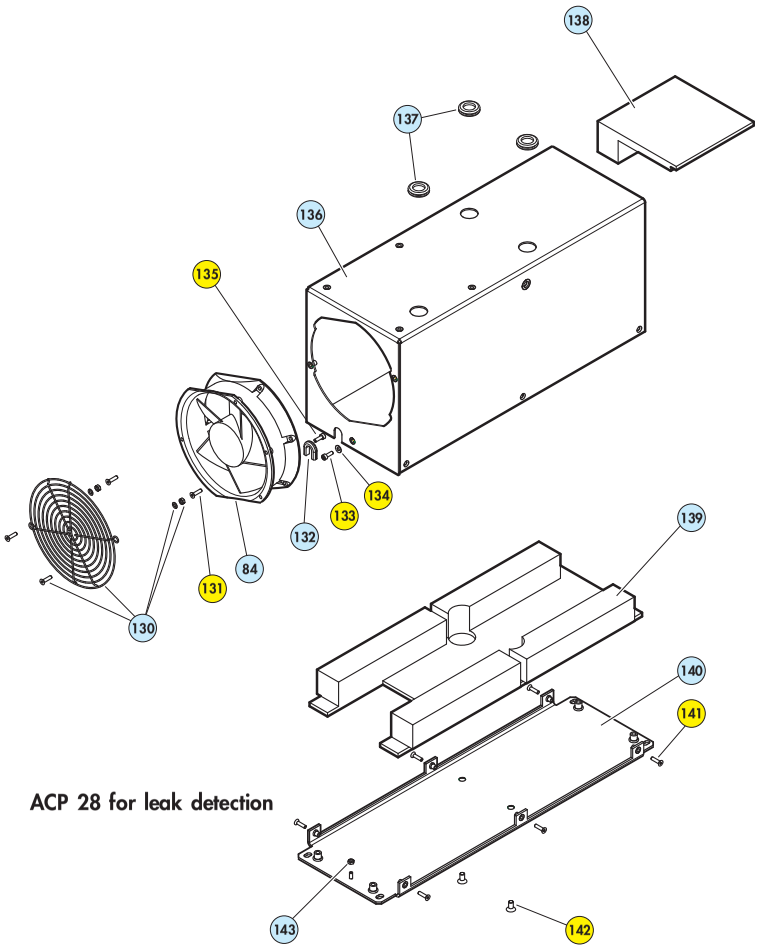
F 100

Cover spare part list

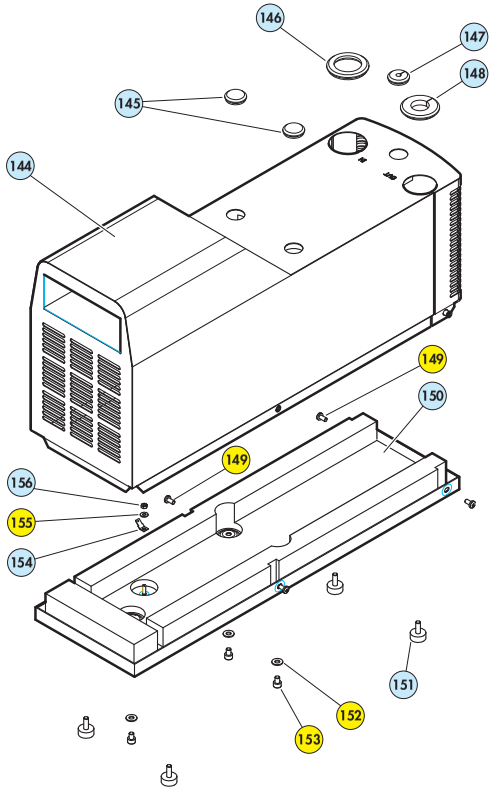
Ref.	Description	Qty*	P/N
	ACP 28 for leak detection		
84	Equipped 24 V fan	1/1	**109022**
130	Fan grid	1/1	**105648**
131	Screw FHc M4-M16	2/2	⬡
132	Protection	1/1	**109255**
133	Screw CHc M4-12	1/1	⬡
134	Washer M4	1/1	⬡
135	Screw CHc M5-12	1/1	⬡
136	Equipped cover	1/1	**A005697**
137	Feed through sleeve	3/3	**101962**
138	Upper foam protection	1/1	**A329696**
139	Lower foam protection	1/1	**103793**
140	Equipped base	1/1	**A005698**
141	Screw FHc M4-16	6/6	⬡
142	Screw FHc M6-12	2/2	⬡
143	Nut H M4	1/1	⬡
	Other models		
144	Equipped upper cover ACP 28 / ACP 28 G	1/1	**109302**
	Equipped upper cover ACP 40 / ACP 40 G	1/1	**110647**
145	Plug washer	2/2	**A460258**
146	Inlet washer ACP 28	1/1	**A459745**
	Inlet washer ACP 40	1/1	**A459758**
147	Spray washer (G models)	1/1	**A459747**
	Plug washer (standard models)	1/1	**A460258**
148	Equipped low washer	1/1	**A461085**
149	Screw CBLZ M5-10	4/4	⬡
150	Equipped low cover	1/1	**109301**
151	Damper	4/4	**108469**
152	Washer M6	3/3	⬡
153	Screw CHc M6-8	3/3	⬡
154	Clip connector 6,35	1/1	**109021**
155	idem 134	1/1	-
156	idem 143	1/1	-

(*) Quantity / Total quantity

⬡ **Screw kit**



ACP 28 for leak detection



ACP 28 / ACP 28 G
ACP 40 / ACP 40 G

GB 01338 - Edition 02 - August 04

M

Chapter G

ACP 28/40
Technical Reference Manual

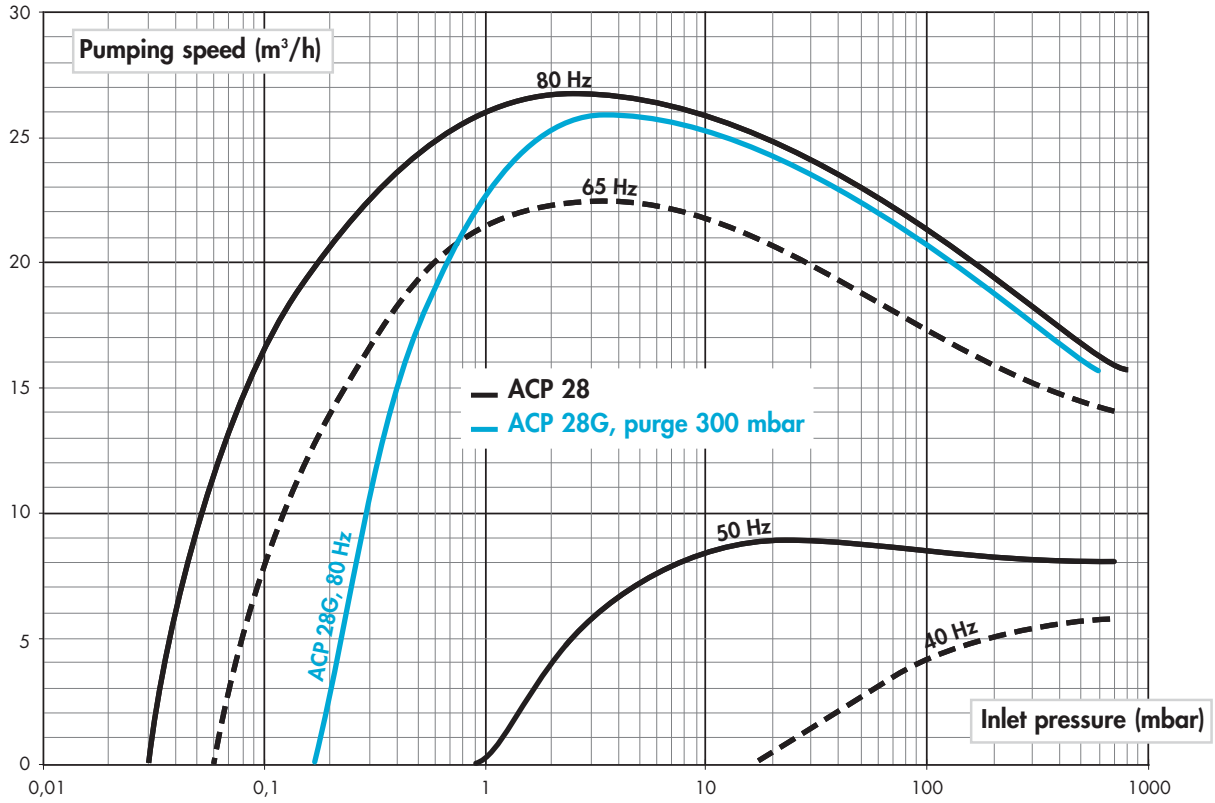
Appendix

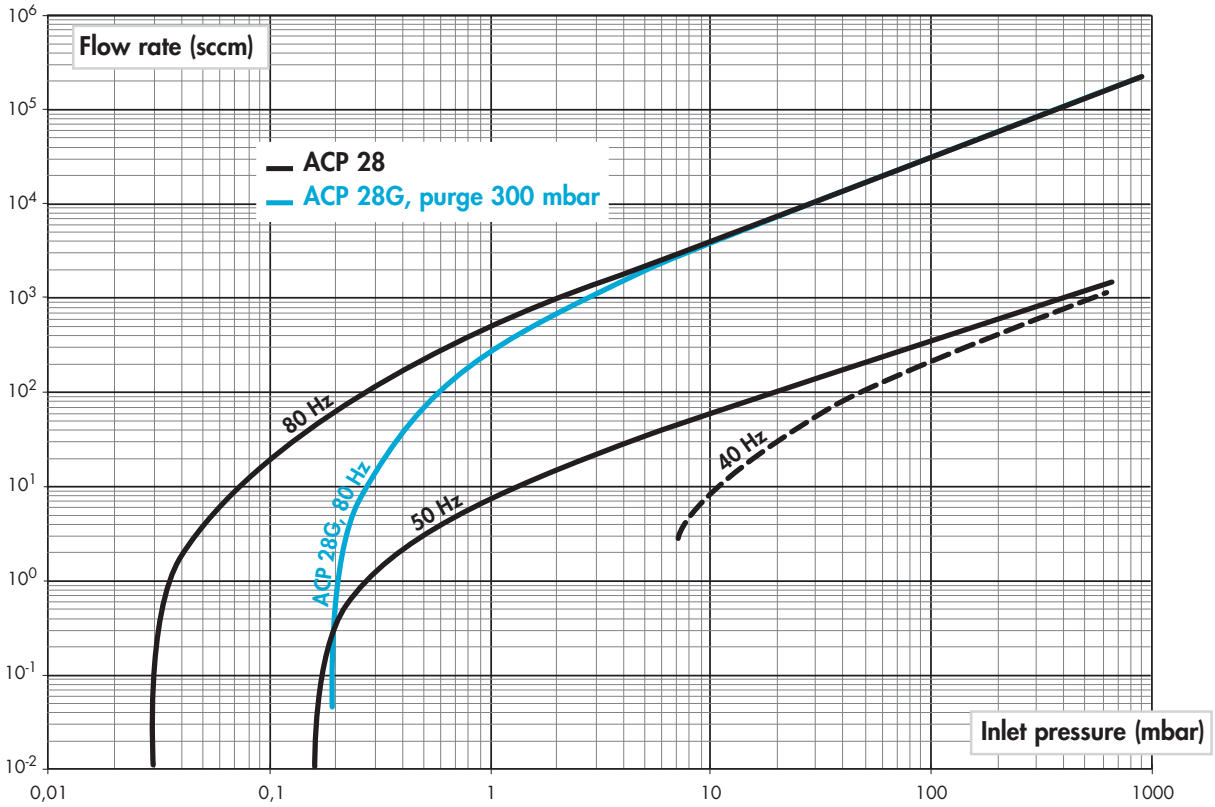
- Pumping curves ACP 28/ACP 28 G . . . . . **G 11**
- Pumping curves ACP 40/ACP 40 G . . . . . **G 12**
- Safety questionnaire . . . . . **G 30**
- Expertise questionnaire . . . . . **G 40**
- ACP 28, ACP 28 G, ACP 40, ACP 40 G electrical wiring . . . . . **G 50**
- ACP 28, ACP 28 G, ACP 40, ACP 40 G electrical diagram . . . . . **G 60**
- ACP 28 for leak detection electrical diagram . **G 70**
- Declaration of conformity, safety instructions. . **G 100**

F 01348 - Edition 03 - March 05

Note: In the present chapter, the letter M located at the top of the page indicates that the corresponding section does not exist in the User's Manual.

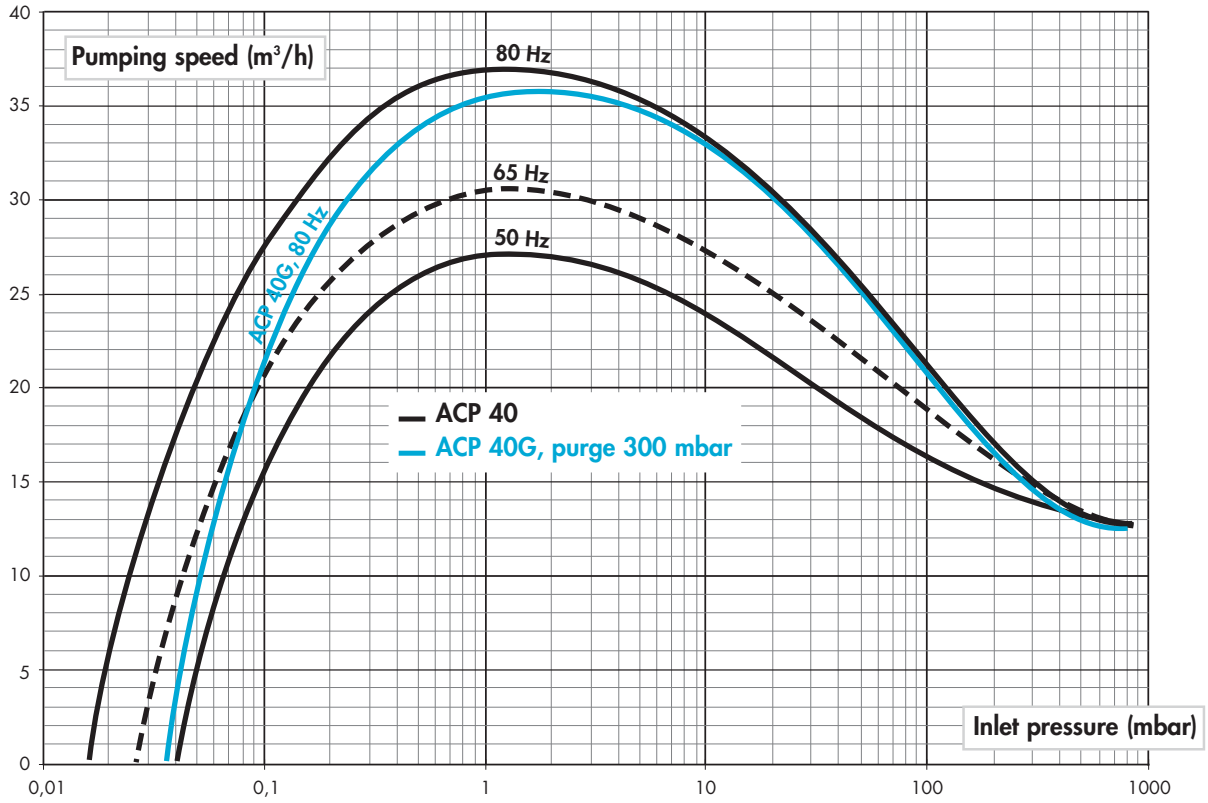
Pumping curves ACP 28 / 28G

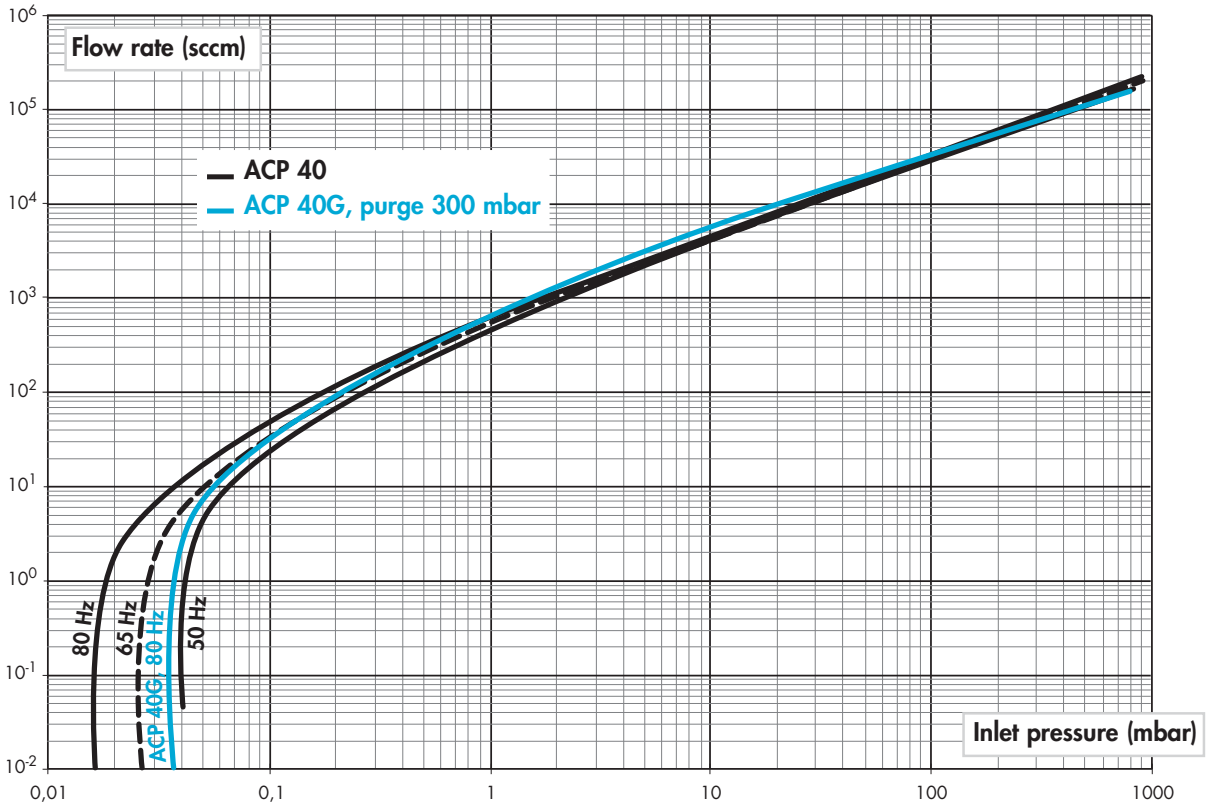




GB 00958 - Edition 04 - February 04

Pumping curves ACP 40/ACP 40 G





GB 02226 - Edition 02 - April 04

ALCATEL

SAFETY QUESTIONNAIRE

Procedure for returning ALCATEL vacuum pumps and helium leak detectors

You wish to return an Alcatel vacuum pump or helium leak detector for maintenance. The equipment will be dismantled and possibly cleaned by a technican from our Service Centre.
In order to ensure the effective safety of our staff and protection of the environment, we need to know the types of gas or substances with which the pump or leak detector has been used.
This will enable us to take the appropriate safety measures.

The following page contains a questionnaire that you can use for this purpose. This procedure complies with the European Community's L360 directives and articles L231 and R231 of the French Labour Code.

We wish to draw your attention to the following points:

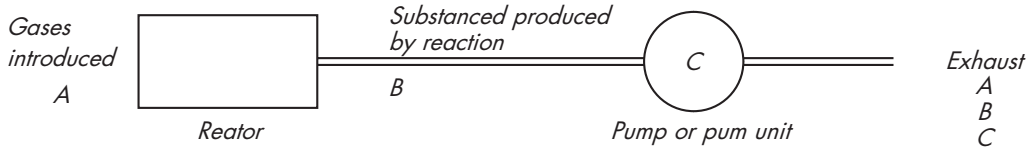
- The risk may be of the following nature:
- **Chemical:** danger to health, risks of explosion, fire, risks for the environment. Please indicate the chemical formula and name of the gases or substances that have been in contact with the equipment (pump or helium detector).

- **Biological:** pathogenic germs, micro-organisms (bacteria, viruses, etc.) classes 1 to 4 and group E.
  We are currently unable to deal with contamination of this sort without risk to the safery of our staff. If your equipment has been contaminated in this way, contact us so that we can try to find a solution together.

- **Radioactive:** contact us in this case.

- **Attention!**

In the event of chemical contamination, please indicate the following gases or substances:



- gases (or substances) introduced into the reactor and which may be found at the exhaust (A),
- gases (or substances) resulting from the reaction or process (B),
- gases (or substances) that may possibly be formed inside the pump (due to a thermodynamic or chemical reaction, condensation, deposition, precipitation, etc.) (C)

- Precautions need to be taken before transferring contaminated pumps.
  Please contact customer service for recommendations.

F 00956 - Edition 02 - Juin 03

ALCATEL

QUESTIONNAIRE DE SECURITE
SAFETY QUESTIONNAIRE

Procédure de retour des Pompes à Vides et Détecteur de Fuite à Hélium ALCATEL
Procedure for returning ALCATEL Vaccum Pumps and Helium Leak Detectors
(Ce formulaire ne peut être rempli et signé que par une personne habilitée)
(This questionnaire is only to be filled in and signed by an authorized person)

SOCIETE - *COMPANY*

Nom Société – *Name of company :* .....

Nom personne – *Name of person :* .....
(Qui rempli ce formulaire) – *(Who has filed in questionnaire)*

Fonction – *Position :* .....

N Tél. – *Tel. no :* .....

N Fax – *fax no:* .....
(Pour renseignements éventuels sur les produits utilisés) – *(for any information on products used)*

EQUIPEMENT - *EQUIPEMENT*

Description : .....

.....

.....

N de Série – *Serial no :* .....

Type de procédé – *type of process :* .....
(Pour lequel l'équipement est utilisé) – *(for which equipment is used)*

Date de l'expédition – *Date of consignment :* .....

INTERVENTION - *SERVICE*

Intervention souhaitée (Révision, réparation,...) – *Servicerequired (overhaul, repair, etc.):*
Type d'anomalie constatée – *Type of anomaly observed :*

PROCEDE CUIVRE – COPPER PROCESS

Produit utilisé sur un procédé Cuivre – Product used on a Copper process Oui – Yes Non – No
Si "Oui" emballage étanche et étiquette spécifique sont requis - If "Yes", sealed package and specific label are required

ASPECT SECURITE – *SAFETY ASPECT*

L'équipement mentionné ci-dessus a été en contact avec les produits suivants – *The above equipment has been in contact with the following substances :*
(nom et formule chimique) – (*name and chemical formulo)*

Ces produits présentent un risque de nature			***These susbstances present the following risks***
Chimique – *Chemical*			Explication détaillée – *Detailed explanation*
Toxique – *Toxic*	Oui – *Yes*	Non – *No*	Si "Oui" risque de nature – *If "Yes", what type of risk*
Carcinogénique - *Carcinogenic*	Oui – *Yes*	Non – *No*	
Combustible - *Combustible*	Oui – *Yes*	Non – *No*	
Corrosive - *Corrosive*	Oui – *Yes*	Non – *No*	
Explosive - *Explosive*	Oui – *Yes*	Non – *No*	
Biologique – *Biological*	Oui – *Yes*	Non – *No*	
Radioactive – *Radioactive*	Oui – *Yes*	Non – *No*	
Autre – *Other*			
(Vous reporter éventuellement à la page précédente) – *(See preceding page if necessary)*			

SIGNATURE

Vous avez répondu "Oui" à une des questions précédentes :
Je confirme que seules les substances précisées ont été en contact avec l'équipement sus-mentionné, et que les procédures de préparation, d'emballage, et de transport ont été respectées.

You have replied "yes" to one of the above questions:
Iconfirm that only the substances mentioned have been in contact with the above equipment and that the preparation, packing and transport procedures have been complied with.

Je confirme que le matériel sus-mentionné n'a été en contact avec aucune substance dangereuse, et a été vidé de son huile. (Si applicable)

I confirm that the above equipment has not been in contact with any dangerous substance and has been emptied of oil. (if applicable)

Réponse "Oui" (nécessite une protection) *Reply "Yes" (requires protection)*	Réponse "Non" (sans risque) *Reply "No" (no risk)*
Nom - *Name :*	Fonction - *Position :* .....
Fonction - *Position :*	Date : .....
Date :	Signature autorisée – *Authorised signature :*
Signature autorisée – *Authorised signature :*	
Tampon / Cachet *Stamp / Seal*	Tampon / Cachet *Stamp / Seal*

ALCATEL Vacuum Technology France – 98, avenue de Brogny – B.P. 2069 – 74009 ANNECY CEDEX
Tél. (33) 4 50 65 77 85 – Fax (33) 4 50 67 23 34

F 00956 - Edition 02 - Juin 03

G 40

ACP 15 / 15 G / ACP 28 / 28 G / ACP 40 / 40 G
ANALYSIS QUESTIONNAIRE

INSTALLATION DESCRIPTION / CONDITION USE

CUSTOMER: _____ **SERIAL NUMBER:** _____

Type of the pump:	❑ Model ACP 15	❑ Model ACP 15 G
	❑ Model ACP 28	❑ Model ACP 28 G
	❑ Model ACP 40	❑ Model ACP 40 G
Pump installed since:	❑ Less than 3 months	❑ Between 3 and 6 months
	❑ Between 6 months and 1 year	❑ More than 1 year
RUNNING TIME		
Total running time:	..... hours	
Frequency of use:	❑ Non-stop	❑ Between 12 and 24 hours/day
	❑ Between 8 and 12 hours/year	❑ Between 1and 8 hours/day
	❑ Less than 1 hour/day	❑ A few hours/week
Using voltage:	❑ 220 V ❑ 115 V	❑ Other:
Environment:	❑ R&D	❑ Cleanroom
	❑ Basement	❑ Other:
Functionning ambient temperature:	❑ Less than 10 °C	❑ From 10 to 20 °C
	❑ From 20 to 30 °C	❑ From 30 to 40 °C
	❑ More than 40 °C	
Pumped volume:	❑ Less than 10 l	❑ Between 10 and 50 l
	❑ Between 50 to 100 l	❑ More than 100 l

Nature of pumped gases: .....

.....

Application/Equipment: .....

.....

.....

SEIZURE ANALYSIS

DATE OF FAILURE: _____

The pump seized:	❑ at first start	❑ during normal cycle	❑ During stand-by mode
	❑ on re-start after complete stop		
	❑ on re-start of new cycle after stand-by		
Place of storage:	❑ stored at the place of use		❑ stored in another room temperature: .....
	❑ is often changed of site		

Particular handling conditions: .....

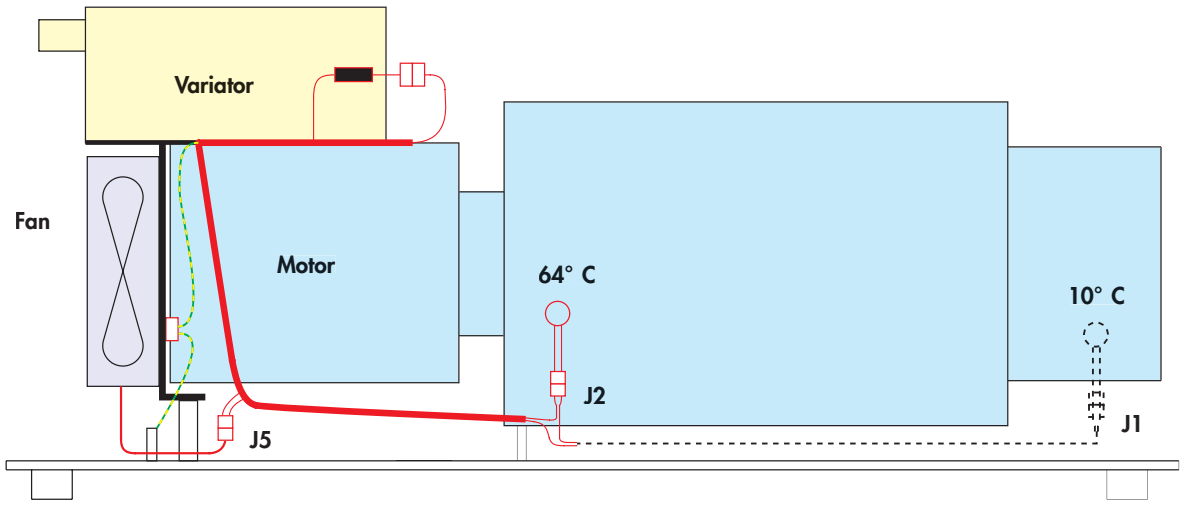
.....

Free comments: .....

.....

GB 00957 - Edition 04 - March 06

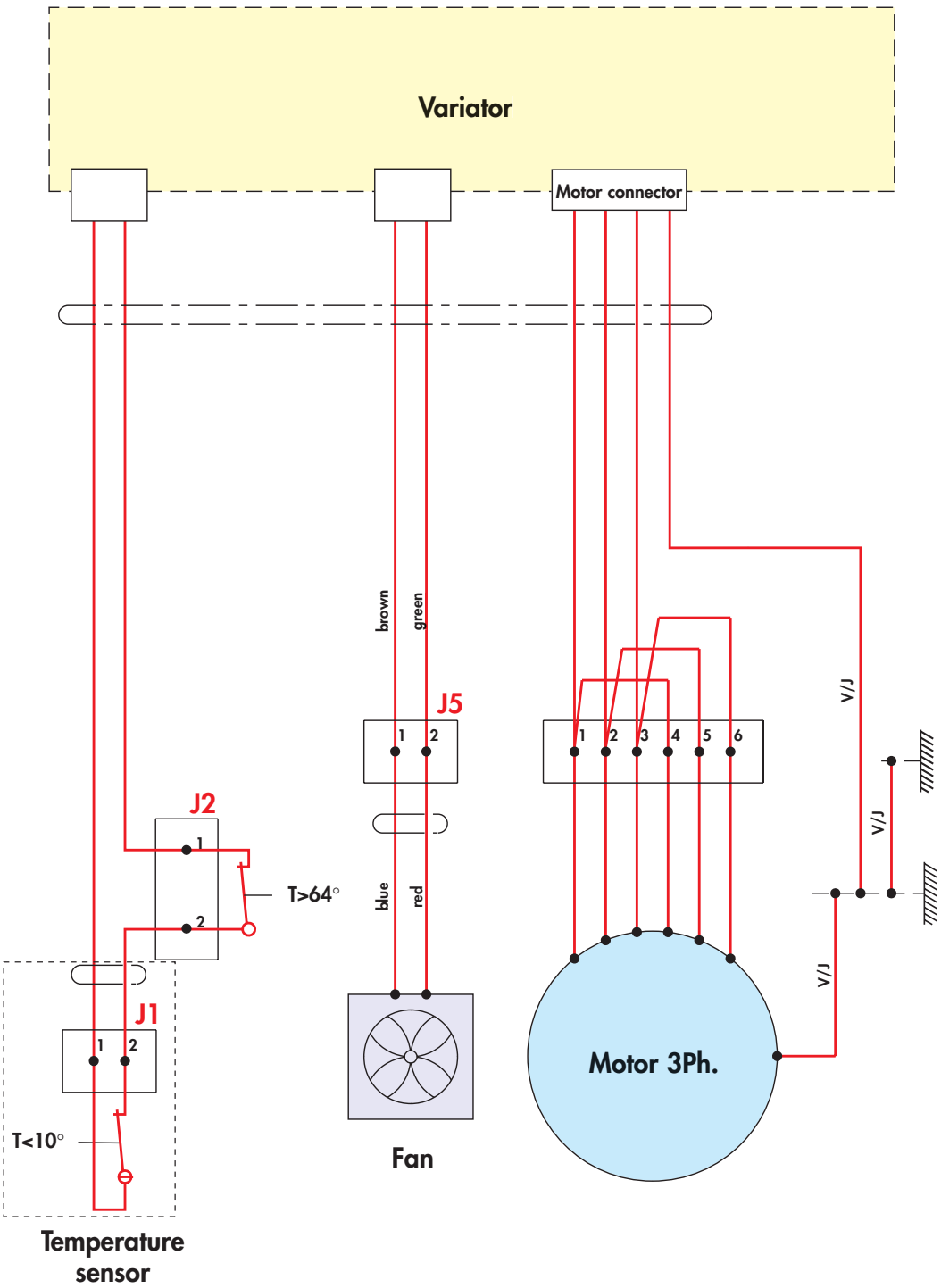
ACP 28, ACP 28 G, ACP 40, ACP 40 G
Electrical wiring



---- After stock exhaust, the low temperature sensor will be introduced in the variator.

GB 01349 - Edition 02 - July 04

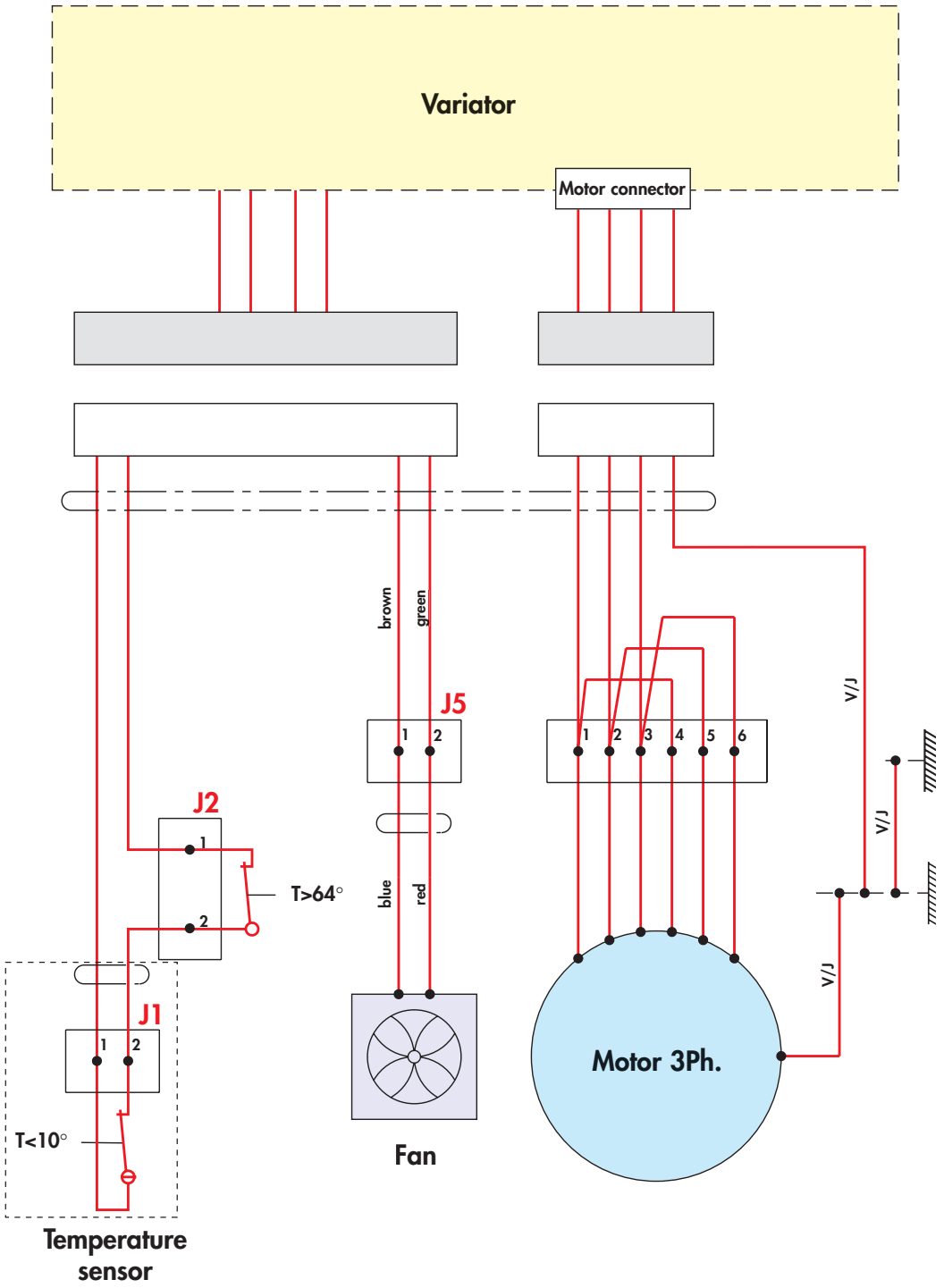
ACP 28, ACP 28 G, ACP 40, ACP 40 G
Electrical diagram



---- After stock exhaust, the low temperature sensor will be introduced in the variator.

GB 01350 - Edition 02 - July 04

ACP 28 for leak detection
Electrical diagram



After stock exhaust, the low temperature sensor will be introduced in the variator.

GB 01351 - Edition 02 - July 04

DECLARATION OF CONFORMITY

We, Alcatel Vacuum Technology France
98, Avenue de Brogny, BP 2069
74009 ANNECY FRANCE

ISO 9001 CERTIFIED

declare under our sole responsibility that the following products :

ACP 28 / ACP 28 G
ACP 40 / ACP 40 G

to which this declaration relates are in conformity with the following European Directives

73 / 023 / EEC	Low Voltage Directive
89 / 336 / EEC	Electromagnetic Compatibility Directive
93 / 68 / EEC	Council Directive (E.C Marking)
98 / 37 / EEC	Machinery Directive

The standards, normative documents, and/or specifications to which the products comply are

NF EN 50081-1	EMC / Generic emission standard / Light industry
NF EN 50081-2	EMC/ Generic emission standard / Industrial environment
NF EN 50082-1	EMC / Generic emission standard / Light industry
NF EN 50082-2	EMC / Generic immunity standard / Industrial environement
ENV 50204	Radiated electromagnetic fiel from digital radio telephones - Immunity test.
NF EN 55011 A1 clB	EMC / Limits for Electromagnetical Conducted and Radiated Interferences
NF EN 55022 clB	EMC / Limits for Electromagnetical Conducted and Radiated Interferences
NF EN 61000-3-2	EMC / Harmonic current emissions
NF EN 61000-4-2	EMC / Immunity to Electrostatic Discharges
NF EN 61000-4-3	Standard Immunity to Radiated Electromagnetic fields
NF EN 61000-4-4	EMC / Immunity to Transient Burst
NF EN 61000-4-5	EMC / Immunity to shock waves
NF EN 61000-4-6	standard Immunity to conducted disturbances induced by radio frequency fields
NF EN 61000-4-11	EMC / For mains power cuts
NF EN 61010-1 +A2	Safety of Machinery / Electrical Equipement of Machinery Safety requirements for electrical equipement for measurement, Control and laboratory use
NF EN 61000-6-2	Electromagnetic Compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
NF EN 1012-2	Compressors and vacuum pumps – Safety requirements
NF EN 563	Safety of machinery – Temperatures of touchable surfaces
NF EN 60742	Transformer design

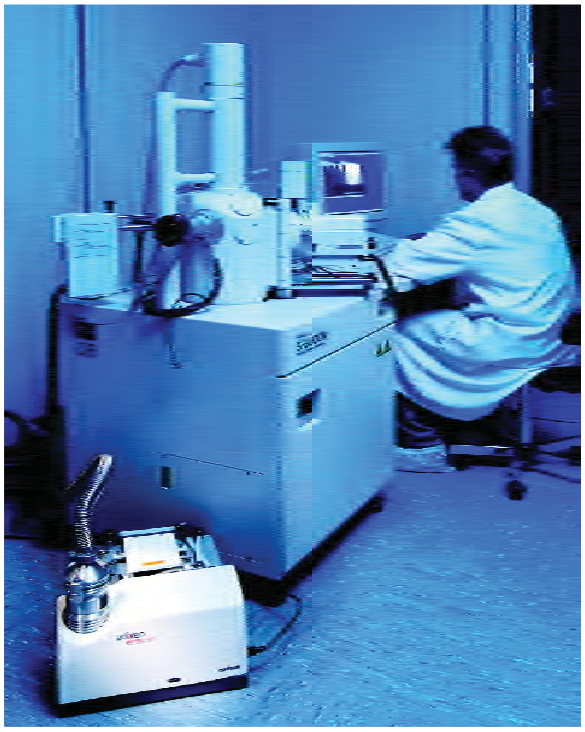
Mr J.Y. GUEGAN, Président Directeur Général

Annecy, 05/04/04

GB 00950 - Edition 04 - August 04

Alcatel Vacuum Technology, as part of the Alcatel Group, has been supplying vacuum pumps, leak detection systems, vacuum measurement and micro machining systems for several years.
Thanks to its complete range of products, the company has become an essential player in multiple applications : instrumentation, Research & Developement, industry and semiconductors.

Alcatel Vacuum Technology has launched Adixen, its new brand name, in recognition of the company's international standing in vacuum position.
With both ISO 9001 and 14001 certifications, the French company is an acknowlegded expert in service and support, and Adixen products have the highest quality and environmental standards.



With 40 years of experience, AVT today has a worldwide presence, through its international network that includes a whole host of experienced subsidiaries, distributors and agents.
The first step was the founding of Alcatel Vacuum Products (Hingham- MA) in the United States, thirty years ago, reinforced today by 2 others US subsidiaries in Fremont (CA) and Tempe (AZ).
In Europe, AVTF-France headquarters and three of its subsidiaries, Alcatel Hochvakuumtechnik (Germany), Alcatel Vacuum Technology UK (Scotland) and Alcatel Vacuum Systems (Italy) form the foundation for the European partner network.
In Asia, our presence started in 1993 with Alcatel Vacuum Technology (Japan), and has been strengthened with Alcatel Vacuum Technology Korea (in 1995), Alcatel Vacuum Technology Taïwan (in 2001), Alcatel Vacuum Technology Singapore, and more recently with Alcatel Vacuum Technology Shanghai (China) (in 2004).
This organization is rounded off by more than 40 represensatives based in a variety of continents.

Thus, whatever the circumstances, the users of Adixen products can always rely on quick support of our specialists in Vacuum Technology.

GB 02834 – Ed 03 – June 2005

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ACP 28/40 - Edition history

List of chapters for the document ED03

The document edition 03 includes the following chapters:

- *Welcome . . . . . Ed 03*
- *General contents . . . Ed 03*
- *Contents chapter A Ed 05*
- *A 10 . . . . . Ed 03*
- *A 20 . . . . . Ed 05*
- *A 30 . . . . . Ed 04*
- *A 41 . . . . . Ed 05*
- *A 50 . . . . . Ed 02*
- *Contents chapter B Ed 06*
- *B 00 . . . . . Ed 01*
- *B 10 . . . . . Ed 04*
- *B 20 . . . . . Ed 04*
- *B 30 . . . . . Ed 03*
- *B 40 . . . . . Ed 05*
- *B 50 . . . . . Ed 03*
- *Contents chapter C Ed 02*
- *C 10 . . . . . Ed 05*
- *Contents chapter D Ed 02*
- *D 10 . . . . . Ed 04*
- *D 20 . . . . . Ed 01*
- *D 30 . . . . . Ed 02*
- *Contents chapter E Ed 02*
- *E 00 . . . . . Ed 01*
- *E 10 . . . . . Ed 03*
- *E 20 . . . . . Ed 02*
- *E 30 . . . . . Ed 02*
- *E 31 . . . . . Ed 02*
- *E 40 . . . . . Ed 02*
- *E 41 . . . . . Ed 02*
- *E 50 . . . . . Ed 02*
- *E 51 . . . . . Ed 02*
- *E 60 . . . . . Ed 02*
- *E 70 . . . . . Ed 02*
- *E 80 . . . . . Ed 03*
- *E 90 . . . . . Ed 03*
- *E 100 . . . . . Ed 02*
- *E 105 . . . . . Ed 01*
- *E 106 . . . . . Ed 02*
- *E 110 . . . . . Ed 02*
- *E 115 . . . . . Ed 01*
- *E 120 . . . . . Ed 02*
- *E 130 . . . . . Ed 02*
- *E 140 . . . . . Ed 02*
- *E 150 . . . . . Ed 02*
- *Contents chapter F Ed 02*
- *F 00 . . . . . Ed 01*
- *F 10 . . . . . Ed 02*
- *F 20 . . . . . Ed 02*
- *F 30 . . . . . Ed 03*
- *F 40 . . . . . Ed 04*
- *F 50 . . . . . Ed 02*
- *F 60 . . . . . Ed 02*
- *F 61 . . . . . Ed 02*
- *F 62 . . . . . Ed 02*
- *F 65 . . . . . Ed 01*
- *F 70 . . . . . Ed 02*
- *F 75 . . . . . Ed 01*
- *F 80 . . . . . Ed 02*
- *F 90 . . . . . Ed 02*
- *F 100 . . . . . Ed 02*
- *Contents chapter G Ed 03*
- *G 11 . . . . . Ed 03*
- *G 12 . . . . . Ed 02*
- *G 30 . . . . . Ed 02*
- *G 40 . . . . . Ed 03*
- *G 50 . . . . . Ed 02*
- *G 60 . . . . . Ed 02*
- *G 70 . . . . . Ed 02*
- *G 100 . . . . . Ed 03*

F 02556 - Edition 02 - March 05

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ACP 28/40 - Edition history

Document evolution from ED02 to ED03

UM	TRM	Sections	Description	Modification order
	X	E 100 - F 20	New bearing block support	OM 6151 - Bis 125
	X	F 20	Update of the complete maintenance kit and screw kit	OM 6395 - OM 6726
	X	F 10	Update of the tool kit	OM 6409 - Bis 139
		E 60	Oil casing modification	OM 6522 - Bis 197
X	X	E 60 - F 30	Oil modification	OM 6619
X		F 60 - F 65	Inlet filter 250 microns	OM 6719
	X	F 60 - F 65 G 50 - G 60 - G 70	Cold temperature sensor suppression	OM 6726
	X	F 60 - F 65	Hot temperature sensor modification	OM 6799
X		A 50 - B 40	Remote interface plug	Bis 181
X		A 50	ES 25 S accessory and sound enclosure	Bis 336
	X	E 70	Functional block disassembly instructions	
	X	E 100 - E 105 - E 106 - E 110 - E 115 - E 120	Functional block assembly and synchronization	
X	X	F65 - F 75	Add of ACP 40 - ACP 40 G models	
X	other* MTR		Add of ACP 15 model on same support	

* Maintenance instructions about ACP 15 dry pump are available in a separated technical reference manual, accessible through the link ACP 15 on this CDrom support.

F 02556 - Edition 02 - March 05

Technical Reference Manual
ACP series dry primary pumps

Welcome

Dear customer,

You have just purchased an Adixen dry primary pump. We would like to thank you and are proud to count among our customers.

This product benefits from Alcatel's many years of experience in producing vacuum products in many applications like Instrumentations, R & D, Semi-conductors process. In the last field, thousands of dry pumps, based on the ACP technology are currently running.

In order to guarantee performance and obtain full satisfaction from this equipment, we suggest that you study this manual, particularly chapter B devoted to installation and start-up, before installing or performing maintenance on your pump.

APPLICATIONS:

ACP 15, ACP 28 AND ACP 40 DRY PRIMARY PUMP FOR «CLEAN» APPLICATIONS

- Instrumentation
- Research and Development
- Semi-conductors: Load lock - Transfer chamber

ACP 28 G, ACP 40 G DRY PRIMARY PUMP FOR THE PUMPING OF CORROSIVE GAS TRACES.

FEATURES:

MULTI-STAGE ROOTS TECHNOLOGY
UNIVERSAL SINGLE PHASE ELECTRICAL SUPPLY
AIR COOLED

GB 01323 - Edition 03 - March 05

MANUAL REFERENCE: **109 573**
(CDROM SUPPORT)
EDITION: **03 - MARCH 2005**

Technical Reference Manual
ACP series dry primary pumps

This product complies with the requirements of European Directives, listed in the Declaration of Conformity contained in G100 of this manual. These Directives are amended by Directive 93/68/E.E.C (E.C. Marking).
The Declaration of Conformity with the Safety Instructions is available at the end of the manual.

Specifications and information are subject to change without notice by Alcatel Vacuum Technology France.

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Technical Reference Manual

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WARNING

Warnings are used when failure to observe instructions could result in injury or death.

CAUTION

Cautions are used when failure to observe instructions could result in significant damage to equipment and/or facilities.

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ACP Series dry primary pump overview

Superior technology

■ Type Multi-stage Roots primary pump
- frictionless technology
- reliability
- aluminium pump body

■ Dry and clean vacuum
- no particulate contamination
- residual gas spectrum free of traces of hydrocarbons

■ Sealed air-cooled motor
- permanent air cooling (built-in fan)
- safety: certified leaktight

■ Single-phase frequency converter
- multi-voltage, dual frequency 50/60 Hz

■ 2 pump models according to different applications
- standard version
- G version

■ Thermal protection based on temperature sensors.

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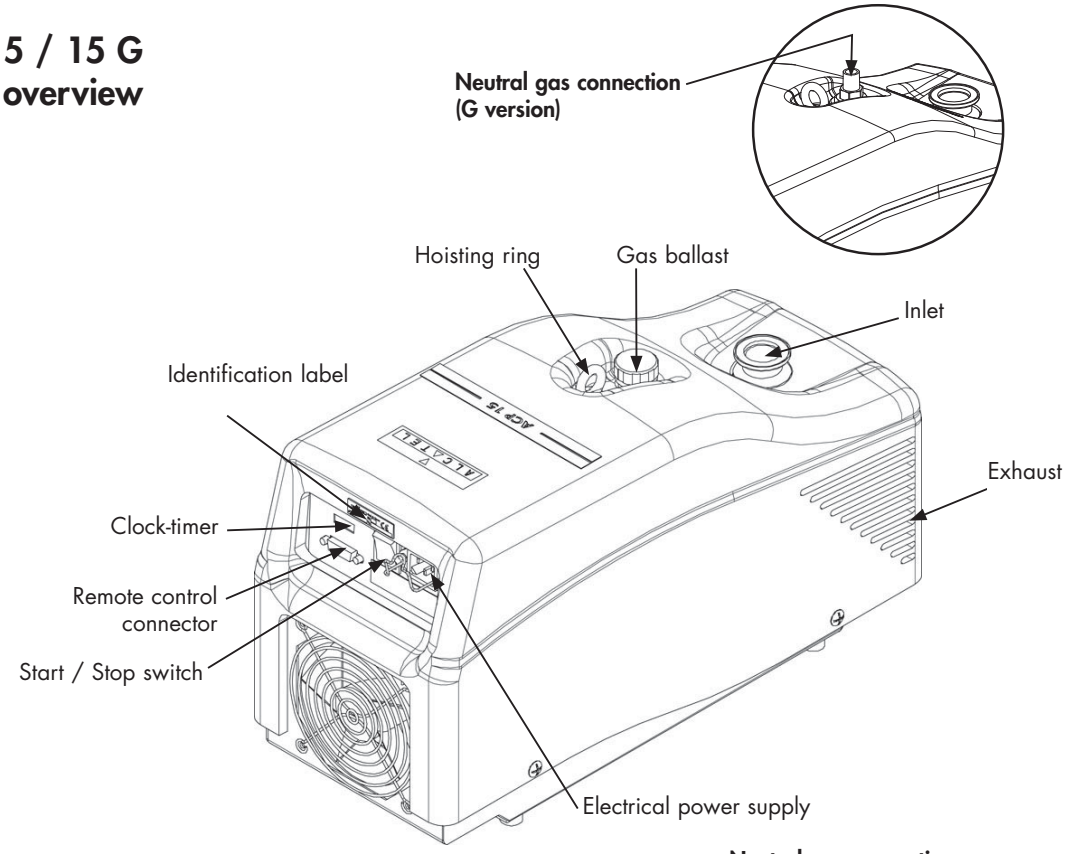
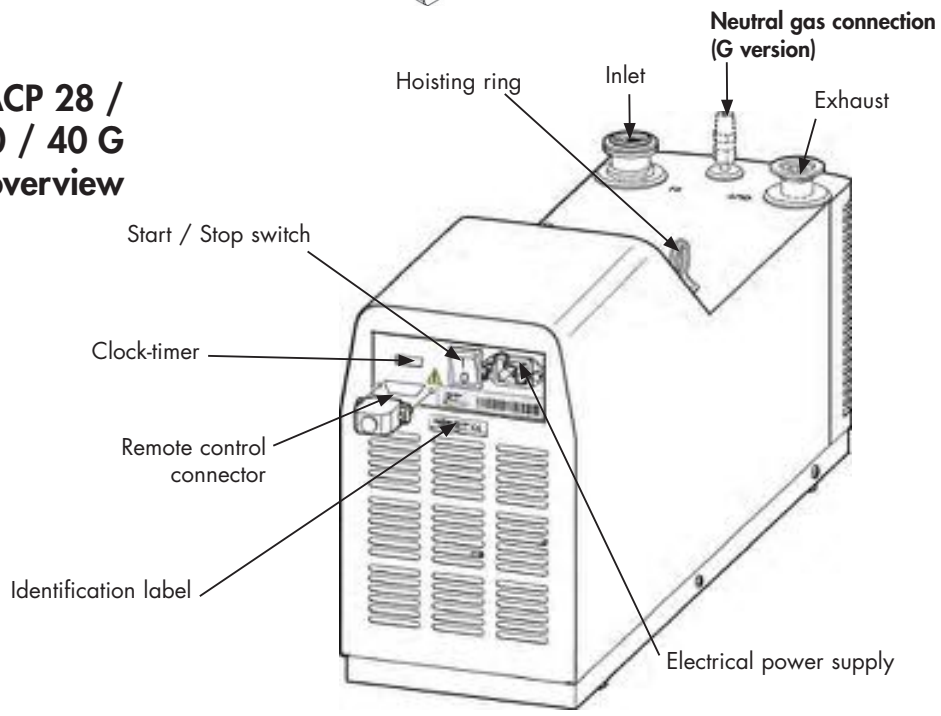
ACP Series dry primary pump overview

Model ACP 15 / 15 G overview



Models ACP 28 / 28 G / 40 / 40 G overview



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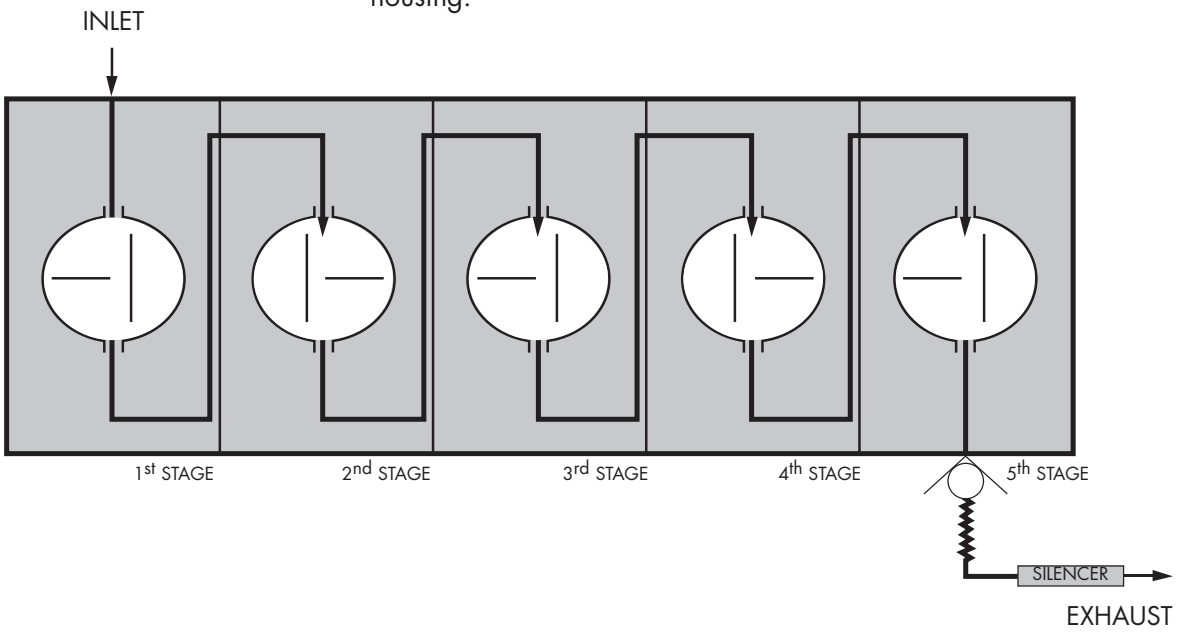
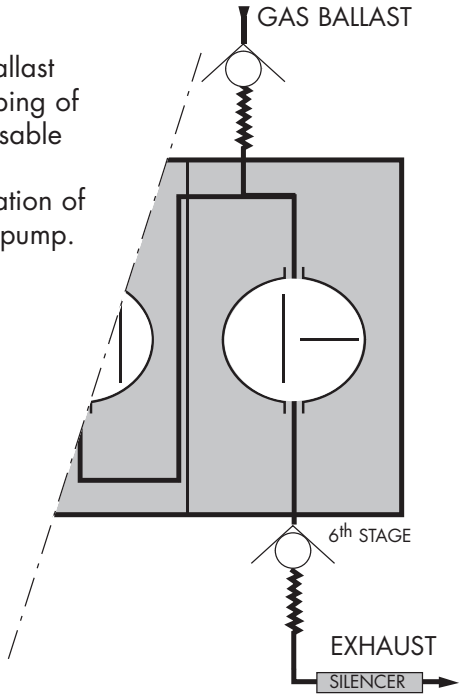
Operating principle

Multi-stage Roots principle

■ The ACP pumps are composed of 5 or 6 Roots type stages, connected in series.
■ No contact design. The rotors do not touch each other or the housing.



■ The ACP15 pump is equipped with a gas ballast device to improve pumping of light gases and condensable vapors.
Thus avoiding condensation of pumped gases into the pump.



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Operating principle

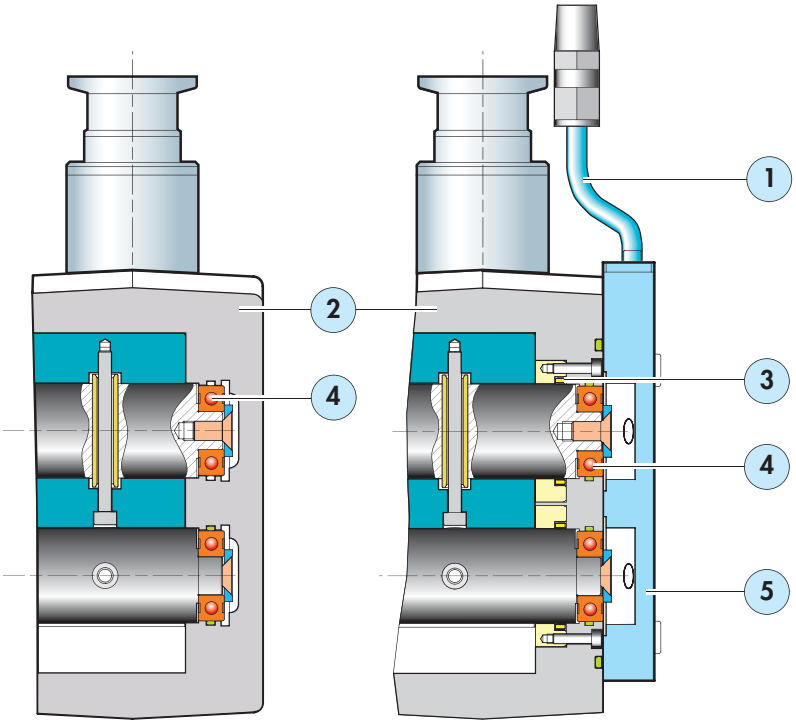
Leak-tightness on low pressure bearings

On the low pressure side of the pump, ball bearings are lubricated with grease that is resistant to high temperatures and corrosion.
On G version, an over pressure area is created around the bearings by injecting a neutral gas.
This pressurization prevents pumped gases from migrating towards the bearings.

CAUTION

Neutral gas purging is imperative for the pumping of corrosive gas traces.

Standard version **G version**



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1 - Gas purge

2 - Inlet stage

3 - Lips seal

4 - Ball bearings

5 - Injection plate

Operating principle

Leak-tightness on high pressure bearings

The rotation of the lubrication plate in an oil bath ensures ball bearings and gears lubrication.

The tightness between the oil casing and the exhaust stage is guaranteed by a deflector, a trap and a double lips seal.

These features have several other functions:
- barrier to pumped gases (protection of the bearings)
- barrier to fluid recovery in the exhaust stage (clean vacuum).

Beside, G version includes a gas injection line.

1 - Exhaust stage (HP)

2 - HP bearing support

3 - Double lips seal

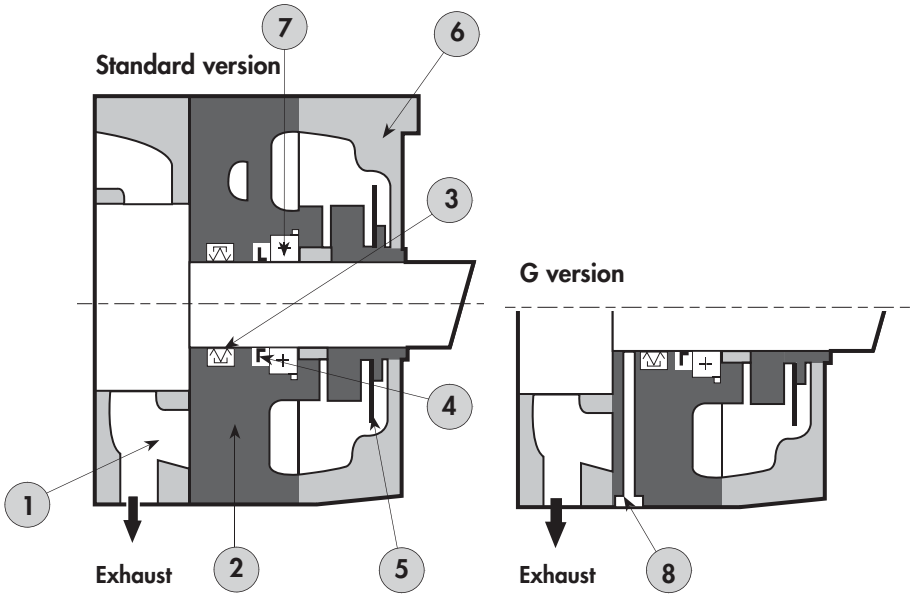
4 - Deflector

5 - Lubrication plate

6 - Gearbox casing

7 - Ball bearings

8 - Gas purge



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Dry primary pump applications

Standard version for "clean vacuum" applications

The pump is designed for applications that require the pumping of clean (dust-free) and non-corrosive gases. Examples are:

■ Instrumentation:
• Gas analysis.
• Electronic microscope.
• X-ray spectrometer.
• Leak detection.
• Surface analyzer.

■ Research and Development

■ Semiconductor Fabrication:
• Load lock and transfer chamber pumping.
• Wafer back pumping.

G version for pumping of corrosive gas traces or condensable gas

G version pump is compatible with the pumping of corrosive **traces**. It is equipped with 3 gas purge circuits used to withstand gas traces, to protect the LP and HP ball bearings, and the pump thightness is reinforced. This pump model can be used in applications such as:

• Process monitoring.
• Load lock pumping.
• Transfer chamber pumping.
• Focused Ion Beams.

For corrosive gas pumping contact the manufacturer.

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Technical characteristics - ACP 28 / 28 G / 40 / 40 G

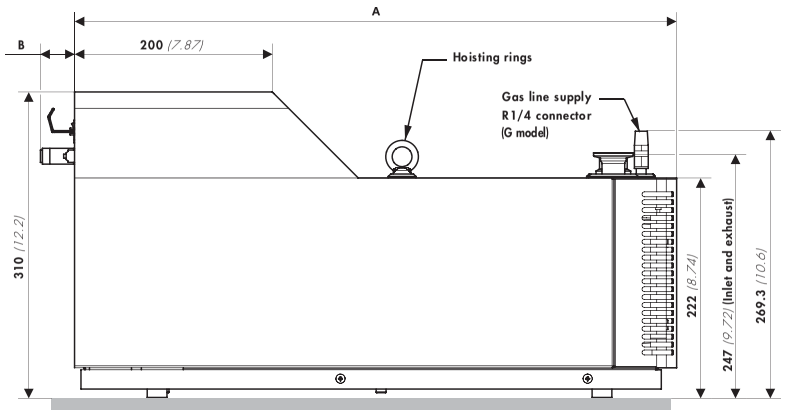
Specifications

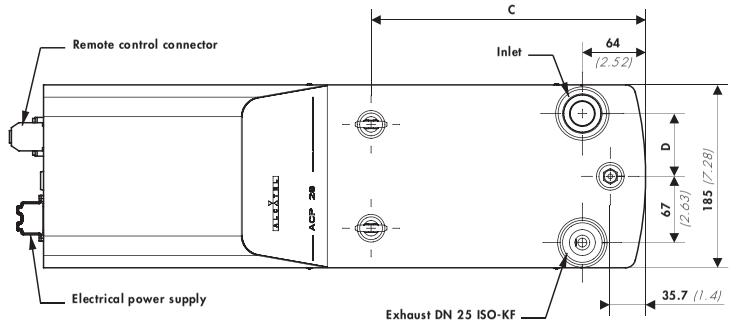
	Unit	ACP 28	ACP 28 G	ACP 40	ACP 40 G
Utilisation		Indoor			
Functioning altitude	m (ft)	< 2000 (6561)			
Installation category		II			
Pollution degree		2			
Ultimate pressure without purge	mbar (Torr)	3 x 10 -2 (2.25 x 10 -2)			
Ultimate pressure with purge	mbar	--	1 x 10 -1	--	1 x 10 -1
Peak pumping speed (rotation speed 4800 rpm)	m3/h (cfm)	27 (16)		37 (22)	
Max. vibrations transmitted at the inlet (4 to 400 Hz spectrum)		Max. displacement 3 mm Speed 1 mm/s			
Maximum pressure at inlet (absolute)	mbar (Torr)	1013 (760)			
Maximum exhaust pressure (absolute)	mbar (Torr)	1200 (900)			
Max. ambient operating temperature	°C (°F)	+ 40 (+ 104)			
Min. ambient operating temperature	°C (°F)	+ 12 (+ 54)			
Leakage current	mA	< 5			
Power consumption at ultimate pressure ... at atmospheric pressure	W	700 1200			
N2 gas purge flowrate*	slm	--	1.65	--	1.65
Single phase power Automatic switch voltage (high or low)		110 / 230 V ± 10% - 50/60 Hz 10 A / 5 A - 1150 VA			
Fan flow rate	m3/h	410			
Inlet port		DN 25 ISO-KF		DN 40 ISO-KF	
Exhaust port		DN 25 ISO-KF			
Oil capacity**	cm3	25			
Weight	Kg (lbs)	33 (72.75)	33.5 (73.85)	38 (83.79)	40.5 (89.28)
Storage temperature	°C (°F)	mini -10 (14)/ maxi 40 (104)			

* relative nitrogen pressure 300 mbar.

** oil charge has been introduced into oil casing at factory. Don't modify this oil level.

Dimensional drawing mm (inch)





	A	B	C	D	Inlet
ACP 28 ACP 28 G	609	35	277.7	63.5	DN 25 ISO KF
ACP 40 ACP 40 G	634	35	300.7	60	DN 40 ISO KF

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Accessories

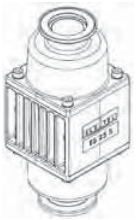
Inlet filter

The inlet filter is installed on the pump inlet and collects particles with a diameter greater than 25 microns (vacuum packing, metallurgy, lamp manufacture, evaporation, etc.).

Model	Part number
IPF 25 (for ACP 15/28)	**111 649**
IPF 40 (for ACP 40)	**111 647**

Exhaust silencer

In order to reduce noise level at the exhaust when the pump is operated at high pressures.



Model	Part number
Silencer ES25S	**109 873**

Sound inclosure

In order to reduce significantly noise level.

Model	Part number
For pump ACP 28 or ACP 40	**110 701**
NRC 15 for pump ACP 15	**111 968**

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B Installation

User's Manual ACP Series
Detailed contents

B 00 *Safety instructions*

- Installation and start-up
- Operation

B 10 *Installation*

- Unpacking
- Equipment storage
- Ventilation
- Installation safety instructions

B 20 *Mechanical connections*

- Inlet
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B 30 *Electrical connections*

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- Rear panel of the pump
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B 40 *Remote control connector wiring*

- Remote control principle
- Wiring of the remote control plug
- Wiring of output S2

B 50 *Inert gas purge connection (G version)*

- Gas line connection
- Nitrogen flowrate adjustment

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Safety instructions

Before powering up, the user must study the manual, the safety instructions of G 100 and follow instructions "warning" and "caution".

Installation and start-up

■ Our products are designed to comply with current EC regulations. Any modification of the product made by the user is liable to lead to non-compliance with the regulations, or even to put into doubt the EMC (ElectroMagnetic Compatibility) performance and the safety of the product. The manufacturer declines any responsability for such operations.
■ The EMC performance of the product is obtained on the condition that the installation complies with the EMC rules. In particular, in disturbed environments, it is essential to:

The performance and the operational safety of this product is guaranteed provided that it is used in normal operating parameters defined in this manual.
Any modification of the pump not improved by the manufacturer can compromise the protection ensured by the pump.

- use shielded cables and connections for interfaces,
- stabilize the power supply line with meshing from the power supply source to a distance of 3m from the pump inlet.

When switching off an item of equipment containing capacitors loaded with over 60 VDC or 25 VAC, take precautions at the access to the connector pins (single-phase motors, fitting with mains filter, frequency converter, monitoring system, etc.).

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Safety instructions

Operation


CAUTION

The pump must be operated in the horizontal position with the pumping axis vertical and the inlet operating upwards.


CAUTION

Neutral gas purging is imperative for the pumping of corrosive gas traces.


WARNING

The ACP Series standard version are made to pump on clean gas. The ACP Series G version are made to pump on corrosive gas traces. The manufacturer has no control over the types of gases passing through this pump. Frequently, process gases are toxic, flammable, corrosive, explosive or otherwise reactive. Since these gases can cause serious injury or death, it is very important to plumb the exhaust of the pump to the facility's hazardous gas exhaust system which incorporates appropriate filters, scrubbers, etc., to insure that the exhaust meets all air regulations. Check that pump is correctly connected to the equipment.


CAUTION

The maximum inlet pressure is the absolute atmospheric pressure. A pressure too high can damage the pump.


CAUTION

Make sure that the exhaust pressure does not exceed 1200 mbar (absolute pressure). A pressure too high can damage the pump.


WARNING

The ACP pumps must not be operated in an area with risk of explosion. Consult us to study a solution.

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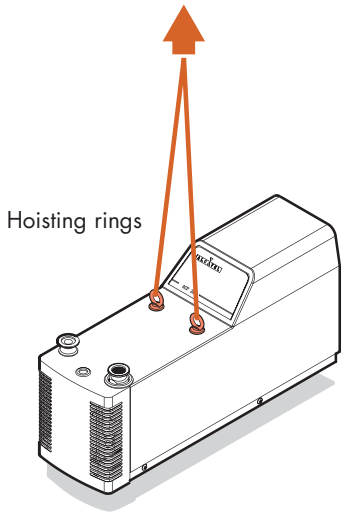
Installation of ACP Series pumps

Unpacking



■ When you receive the equipment, unpack it carefully; do not discard the packaging until you have ensured that the pump has not been damaged during transport. Otherwise, take the necessary measures with the transporting company and, if necessary, notify the manufacturer.

■ For all handling of the equipment, it is highly recommended to use a lifting device. Use the hoisting rings delivered with the pump by screwing them in the threated holes located on the top side of the pump.

Model type	Weight
ACP 15/15 G	23 Kg
ACP 28	33 Kg
ACP 28G	33,5 Kg
ACP 40	38 Kg
ACP 40 G	40,5 Kg

■ The hoisting rings can be removed from the housing.

Equipment storage

■ If the new pump is to be stored, the plugs on the inlet and exhaust ports must remain in position.
The storage temperature must not be below -10 °C.

Ventilation

Vents at both ends of the pump.
Place the pump at least 80 mm from the stationary section.
The ambient air temperature particularly near the fan must be less than 40 °C.

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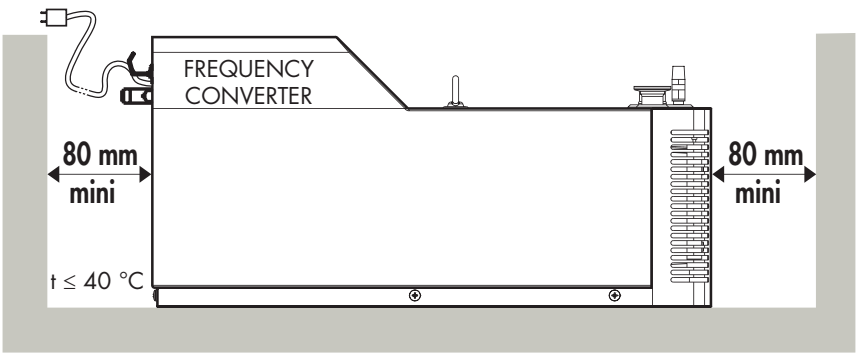

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Installation of ACP Series pumps

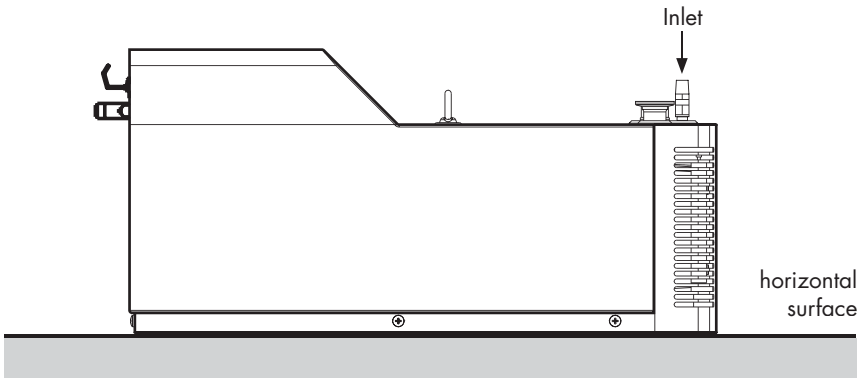
Installation safety instructions

The performance of the pump depends on the type of accessories used and the quality of the mechanical connection.

■ For safety reasons, use accessories on the inlet and exhaust lines whose materials and sealing properties are compatible with the gases being used.
■ Determine where the pump will be placed. Refer to dimensional diagram in section **A 40** or **A 41**.
■ Install the pump in a way that the Start/Stop switch of the pump is accessible for the operator.
■ After pump connection, it is necessary to perform an helium leak tightness test.

CAUTION

The pump must be operated in the horizontal position with the pumping axis vertical and the inlet operating upwards.



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Mechanical connections

Inlet

Remove the protector from the inlet flange.

Connect the pump inlet to the equipment with connecting accessories (see manufactrer's catalog).

Connection type

- ACP 15 / 28 model: DN 25 ISO-KF.
- ACP 40 model: DN 40 ISO-KF.

The maximum inlet pressure is the absolute atmospheric pressure. A pressure too high can damage the pump.

In case of applications involving dust or solid particules, we recommend to use appropriate inlet filters in order to protect the pump (see section A 50).
Also, we advise to use clean fittings and pipings for connecting the pump to the installation.

Exhaust

Remove the protector from the exhaust flange.

When pumping on corrosive gas traces, or aggressive gases (pump G version), the gas can cause injury or death. The exhaust of the pump must be connected to an exhaust stack or an evacuation duct.

Make sure that the exhaust pressure does not exceed 1200 mbar (absolute pressure). A pressure too high can damage the pump.

Connection type

- ACP 15 model: **DN 16 ISO-KF**.
- ACP 28 / 40 model: **DN 25 ISO-KF**.

Several fitting accessories are available in the manufacturer's catalog.

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Electrical connections

General

■ Our products are designed to comply with current EC regulations. Any modification of the product made by the user is liable to lead to non-compliance with the regulations, or even to put into doubt the EMC (ElectroMagnetic Compatibility) performance and the safety of the product. The manufacturer declines any responsability for such operations.

The performance and the operational safety of this product is guaranteed provided that it is used in normal operating parameters defined in this manual.
Any modification of the pump not improved by the manufacturer can compromise the protection ensured by the pump.

■ The EMC performance of the product is obtained on the condition that the installation complies with the EMC rules. In particular, in disturbed environments, it is essential to:

- use shielded cables and connections for interfaces,

- stabilize the power supply line with meshing from the power supply source to a distance of 3m from the pump inlet.

When switching off an item of equipment containing capacitors loaded with over 60 VDC or 25 VAC, take precautions at the access to the connector pins (single-phase motors, fitting with mains filter, frequency converter, monitoring system, etc.).

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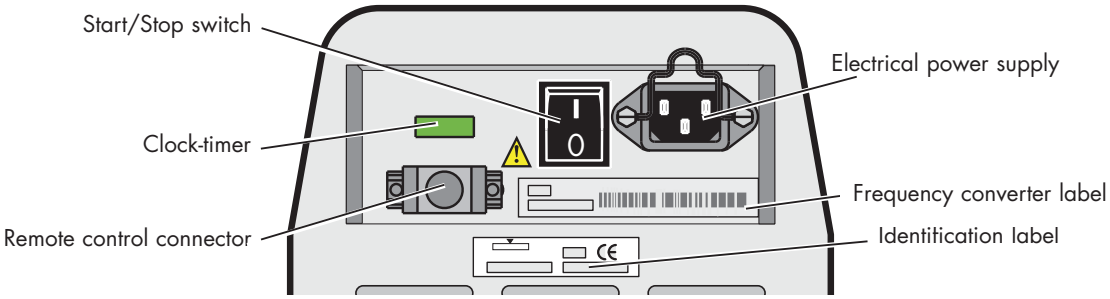
Electrical connections

Rear panel of the pump

■ In accordance with recommandations of EN 61010-1+ A2, the following warning symbol is on the variator inside the pump.

WARNING

Warning: risk of electrical shock.



■ Electrical motor is in accordance with CE standards offers the following voltage range:

Model	Voltage range		
ACP 15	110 V / 230 V 50/60 Hz	10 A / 5 A	1150 VA
ACP 28 / 40			

■ The motor is equipped with an electrical frequency converter which allows automatically low or high voltage pump running, according to range voltage 110 V to 230 V, 50/60 Hz.

■ The pump supplying cable is provided with the pump delivered. The earthing of the pump (frequency converter, covers, body of the pump) is realized by the cable connected with the network customer. The network customer should have himself a connection in the ground.

Circuit breaker

■ An 8 A circuit breaker is recommended for high voltage, 230 VAC + 10 %.
■ A 12 A circuit breaker is recommended for low voltage, 110 VAC + 10 %.

The pump is equipped with thermal sensors which stops pump starting-up depending on the temperature (see C 10).

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Remote control connector wiring

■ In accordance with advice of EN 61010-1+ A2, the following warning symbol is near the remote control connector.

WARNING

Warning: refer to attached documents.

Remote control principle

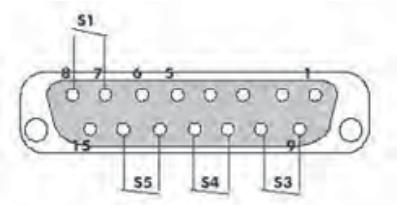
The pump can be used in remote mode using the "Sub-D" connector at the rear of the pump.

Used by means of dry contacts:

- The remote control of the "Start / Stop" function (S1).
S1 = 0 ➔ Stop S1 = 1 ➔ Start.

- Rotation speed remote control according to the table below:
(O = open, 1 = closed):

DB 15 pins, male connector



ACP 15 Model				
S3	S4	S5	Rotation speed	
Contact status	Contact status	Contact status	Hz	rpm
S3 = 1	S4 = 0	S5 = 1	60	3 600
S3 = 1	S4 = 0	S5 = 0	70	4 200
S3 = 0	S4 = 1	S5 = 1	80	4 800
S3 = 0	S4 = 1	S5 = 0	90	5 400
S3 = 0	S4 = 0	S5 = 1	95	5 700
S3 = 0	S4 = 0	S5 = 0	100	6 000

ACP 28 - ACP 40 Model				
S3	S4	S5	Rotation speed	
Contact status	Contact status	Contact status	Hz	rpm
S3 = 1	S4 = 1	S5 = 0	42	2 500
S3 = 1	S4 = 0	S5 = 0	50	3 000
S3 = 0	S4 = 1	S5 = 0	65	3 900
S3 = 0	S4 = 0	S5 = 0	80	4 800

CAUTION

For pumps safety, do not exceed the maximum frequency:
➔ 100 Hz for ACP 15 models,
➔ 80 Hz for ACP 28/40 models.

Note: Changing the rotational speed will affect the pumping speed and the ultimate pressure (see pumping curves).

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Remote control connector wiring

Wiring of the remote control plug

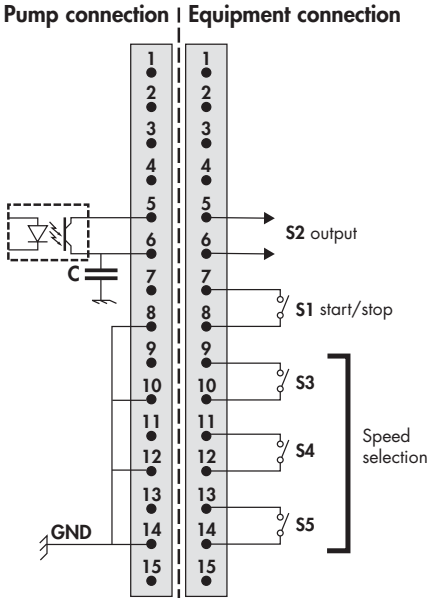
S1, S3, S4 and S5 are inputs.
S2 is an output (open collector).

S1: start/stop

S2 closed:
pump at speed

S3, S4, S5:
rotational speed selection

Pin 8, 10, 12 and 14 are connected to the ground of the control unit.



CAUTION

Do not add any strap except S1, S3, S4 and S5.

CAUTION

Output S2:

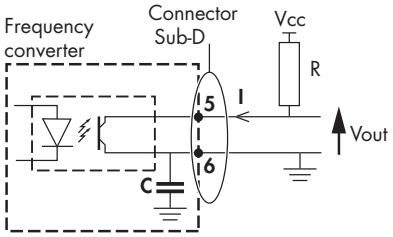
Do not connect a relay between the pins 5 and 6.
The relay coil induces a current which may result in damage of the control unit.

Wiring of output S2:
The maximum value of the current in the output must be of 35 mA.

Wiring of output S2

S2 is an open collector output and must be wired as shown below.

Vcc is a direct voltage (between 7 and 30VDC) supplied by the user. The value of the resistance **R** depends on the customer installation.



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Remote control connector wiring

Vcc and R values must be calculated so as not to exceed a current value of 35 mA.
Higher current will damage the frequency converter.

When the nominal speed is reached, the transistor becomes conductive («on-state») and Vout = 0 V.

As long as the nominal speed is not reached, the transistor is blocked («off-state») and Vout = Vcc.

This circuit can not be used for power transfer. For switching of power circuits an amplification stage is required.

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Inert gas purge connection (G version)

Gas line connection

■ For optimum performances -ball bearing protection-, the nitrogen supply should have the following characteristics:
- Maximum moisture rate: 5 ppm of water
- Dust < 1µm
- Oil < 0.1 ppm
- Pressure:1.5 bar absolute (before the gas pressure reducing valve, customer supply)

■ Connect the gas line supply to the R 1/4 connector provides on purpose with flexible or stainless steel pipe (customer supply).

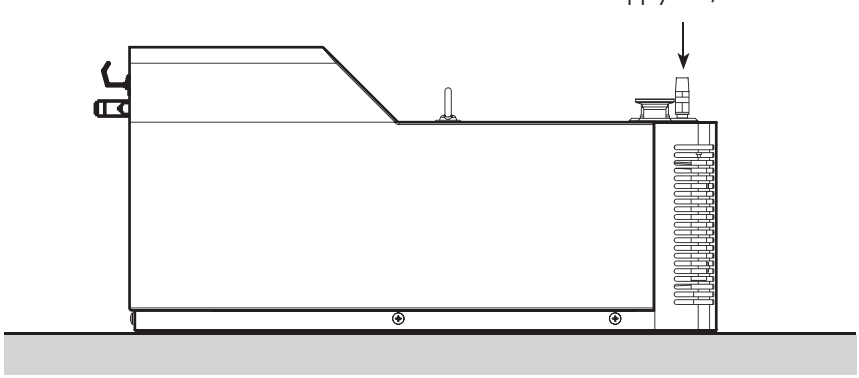
Note : we recommend to install an isolation valve on the gas supply line, nearest the inlet gas port to allow pump performance recovering when the gas line is not used (see **A 40**, **A 41**).

■ For optimum ball bearing protection, the neutral gas pressure must be set to 0.3 bar (relative pressure) according to the flowrate value given in the table below:

Nitrogen flowrate adjustment

	ACP 15	ACP 28/40
Flowrate max (slm)	5	1.65
Ultimate pressure (mbar)	3×10^{-1}	1×10^{-1}

e.g: ACP 28 G



GB 00697 - Edition 04 - March 06

User's Manual ACP Series
Detailed contents

C 10 ***Pump operation***

- Pump temperature for start-up condition
- Local mode
- Remote mode
- Pump start-up
- Pumping of condensable vapors
- Pump stop

GB 00698 - Edition 02 - March 05

Pump operation

CAUTION

The ACP Series uses a specific gear oil. The amount required for pump operation is set at in the factory.
Do not modify this oil level.

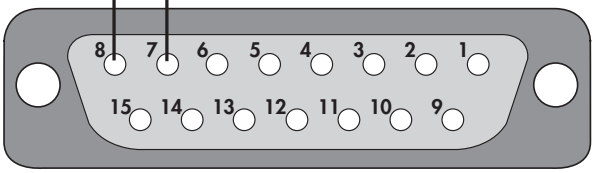
Pump temperature for start-up condition

The pump is equipped with thermal sensors.
When switching on the pump, if the temperature is:
- less than 12 °C,
- or over than 40 °C,
the pump doesn't start, but the fan is energized. The pump will start automatically when the ambient temperature is back in the authorized temperature range.

Operation in local mode

In local mode, the pump can run only if the cover plug (delivered with the pump) is fitted on the remote control connector.

Wiring of the Remote cover plug



DB 15 pins, male connector (soldered side view). Factory wired with appropriate jumper for local operation.

Remote mode

The pump can be used in remote mode only if the "Remote" control plug is wired according to the instructions (see **B 40**).

Pump start-up

Pump is equipped with a main power switch. The pump starts up when the power line cord is connected, and main switch is on "**1**" position.
A time counter displays the pump running time in hour.

GB 00699 - Edition 06 - March 06

Pump operation

CAUTION

Avoid sudden changes in ambient temperature when the pump is running.

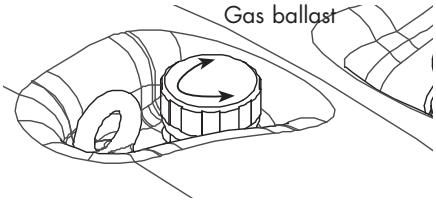
Pumping of condensable vapours

In order to better handle condensable vapours, it is necessary to pump with a hot pump. It is recommended to isolate the pump from the installation and let the pump run for at least 1 hour. Then open the isolation valve, the pump will operate in optimized conditions, thus reducing the risk of condensation inside the pumping module.

ACP 15 model
The ACP 15 pump features a gas ballast valve, the warm-up must be done with opening the gas ballast valve.
Before switching off, isolate the pump from the installation and let it run for 1 hour with gas ballast opened.

Operation of gas ballast (ACP 15 model)

Knob screwed: gas ballast closed,
Knob unscrewed:
gas ballast opened.



Pump stop

Put the main switch on "0" position or press the circuit breaker of the customer's installation.

When the pump is remote controlled, the pump will be stopped by opening the "Start/Stop" contact (see **B 40**).

GB 00699 - Edition 06 - March 06

Chapter D

Technical Reference Manual
ACP series

Maintenance - Troubleshooting

- Maintenance frequency . . . . . D 10
- Instructions for cleaning . . . . . D 20
- Troubleshooting . . . . . D 30

GB 01390 - Edition 02 - March 05

Maintenance schedule

MODEL	TIMING (EVERY...)	DESCRIPTION	
ACP 15	20 000 h or 4 years	Complete maintenance: • oil draining • LP and HP bearing replacement • seal replacement	M — Call customer Service*
ACP 28 ACP 40	22 000 h or 4 years		

* The manufacturer Center Service adress list at the back of the cover Manual.

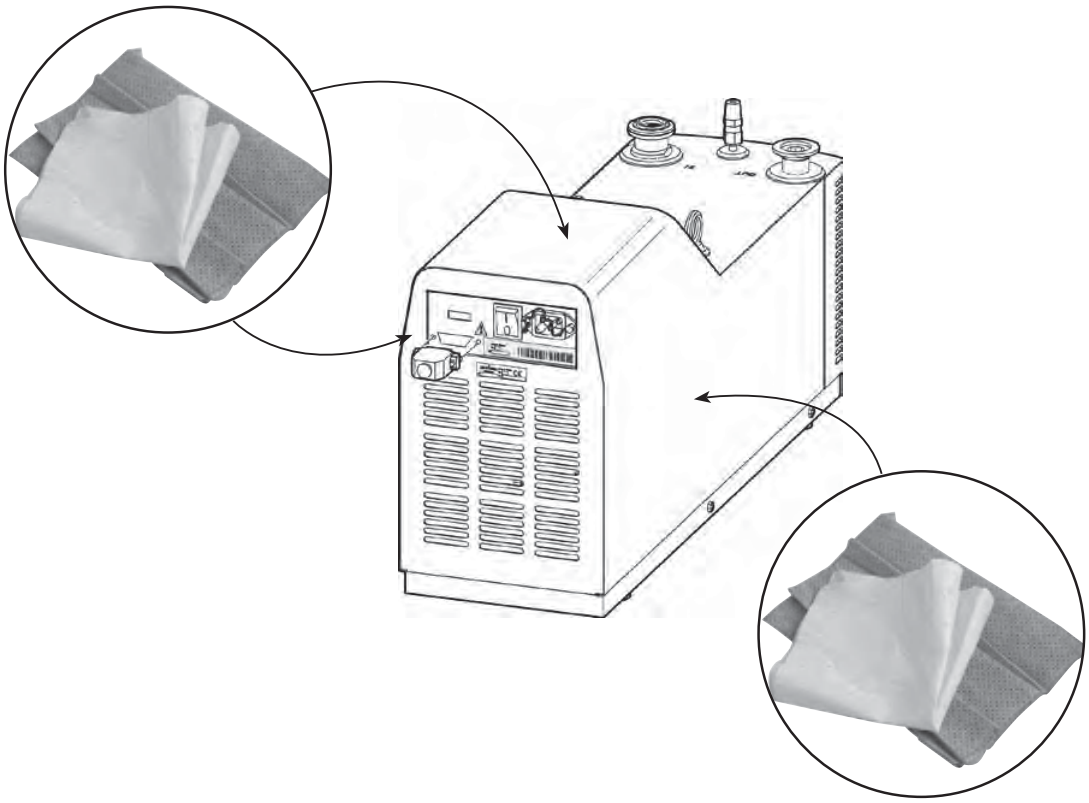
Maintenance frequencies are typical values for non corrosive applications. For applications using G pump versions, these values can be reduced. Contact us.

GB 00702 - Edition 05 - March 06

M Performed by the manufacturer

Instructions for cleaning

■ The outside covers of the pump can be clean with a fluffy free duster. Use a cleaning product avoiding to damage the cover paint and stickers.



GB 00952 - Edition 01 - June 01

Troubleshooting

Symptom	Cause	Solution
Pump doesn't start and the fan doesn't run	**Customer power supply different from 85 V AC -> 260 V AC**	Check customer installation.
	NO	
	Customer main voltage at the IEC cable connector different from 85 V AC -> 260 V AC	Change the power cable.
	NO	
	15 A fuse faulty	• remove the cover (see section **E 30**). • change the variable speed drive (see section **E 160**).
	NO	
	The variable speed drive output voltage is different of 240 V	• disconnect the white connector from the variable speed drive to the motor (see section **E 160**). • measure the voltage at the variable speed drive output. (see section **G 60**). • if U ≠ 240 V, replace the variable speed drive (see section **E 160**).
	NO	
	Electrical connection faulty	Check the status of the connectors and if necessary, check the wire continuity.

GB 02762 - Edition 01 - March 05

Troubleshooting

Symptom	Cause	Solution
Pump doesn't start but the fan runs	**Pump temperature is not between +10° C and +80° C**	• check that the pump is used in normal conditions (see section **B 10**). • wait that the pump temperature reaches a temperature between +10° C and +80° C (see section **C 10**). The pump starts automatically.
	NO	
	Mechanical jamming	• remove the cover (see section **E 30**). • remove the LP Ball bearing cover (see section **E 70**) • check manually that the shafts turn freely. • if not, disassemble the pump and replace the defective parts. • if the shafts turn freely, refer to the next cause.
	Variable speed drive failure	• disconnect the white connector from the variable speed drive to the motor (see section **E 70**). • check the voltage at the variable speed drive output (see section **G 60**). • if the voltage is different from 240 V, replace the variable speed drive, if not, refer to the next cause.

GB 02762 - Edition 01 - March 05

Troubleshooting

Symptom	Cause	Solution
Pump doesn't start but the fan runs (continued)	**Defective electrical connection**	Check the status of the connectors and if necessary, check the wire continuity.
Periodic operation of the pump	**Pump temperature is not between +10° C and +80° C**	• check that the pump is used in normal conditions (see section **B 10**). • wait that the pump temperature reaches a temperature between +10° C and +80° C (see section **C 10**). When thermal sensor switches on, the pump will start again when the pump body has a temperature below 65°C.
	NO	
	Customer main voltage is different 85 V AC -> 260 V AC	Check the customer electrical installation.
	«REMOTE» control connector problem	• check that the remote cover plug is connected on the REMOTE connector. • check the wiring and the connection if the pump is remote controlled.

GB 02762 - Edition 01 - March 05

Troubleshooting

Symptom	Cause	Solution
Abnormal noise	**Insufficient oil level**	Fill in oil in the gearbox (see section **E 60**).
	NO	
	Oil degraded or contaminated	Drain the gearbox, then fill in with a new oil charge (see section **E 60**).
	NO	
	LP bearing damaged	• remove the LP Ball bearing cover (see section **E 70**). • replace the ball bearings (see section **E 70**).
	NO	
	Mechanical jamming	Disassemble the pump and check the following points: • the shaft synchronization • the gears • then replace defective parts.

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Troubleshooting

Symptom	Cause	Solution
Stopping or non start-up of pump	**«REMOTE» control connector problem**	• check that the remote cover plug is connected on the REMOTE connector. • check the wiring and the connection if the pump is remote controlled.
	Pump temperature is not between +10°C and +80 °C	• check that the pump is used in normal conditions (see section **B 10**). • wait that the pump temperature reaches a temperature between +10°C and +80 °C (see section **C 10**). When thermal sensor switches on, the pump will start again when the pump body has a temperature below 65°C.
	NO	
	Variable speed drive speed output voltage is different from 240 V	• disconnect the white connector from the variable speed drive to the motor (see section **E 70**). • replace the variable speed drive (see section **E 160**).
	NO	
	Mechanical jamming	Disassemble the pump (see section **E 70**) and check the following points: • the shaft synchronization • the gears • then replace defective parts.

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Troubleshooting

Symptom	Cause	Solution
The pump doesn't reach the nominal speed	**Remote control connector problem**	check that the remote control plug is correctly connected.
	NO	
	Exhaust clogged	• check that the exhaust valve is correctly installed. • check that no blank off flange is installed on the exhaust. • check that there is no condensate in the exhaust pipe.
	NO	
	Variable speed drive failure	Replace the variable speed drive by a new one (see **E 160**).

GB 02762 - Edition 01 - March 05