Mk5 Upgrade

1. General Information

Conversion from Mk1, Mk2, Mk3 and Mk4 to Mk5

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Concerning	:	GA 5-90
Preliminary Operations:	:	-
Safety Instructions	:	General
Persons Required	:	1
Special Tools	:	-
Consumables	:	-

2. Document Overview

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3. Safety first





4. Introduction

This instruction book describes how to handle the machines to ensure safe operation, optimum efficiency and long service life.

Read this book before changing the machine to ensure correct handling, operation and proper maintenance from the beginning. The maintenance schedule comprises measures for keeping the machine in good condition.

Keep this book available for the trained personnel from Atlas Copco and make sure that the machine is operated. Record all operating data, maintenance performed, etc. in an operator's logbook available from Atlas Copco. Follow all relevant safety precautions, including those mentioned in this book.

Trained personnel from Atlas Copco who can be contacted for any further information must carry out repairs.

In all correspondence always mention the type and the serial number, shown on the data plate and the number of this instruction.

The company reserves the right to make changes without prior notice.

This instruction book meets the requirements for instructions specified by the machinery directive 2006/42/EC and is valid for CE as well non-EC labelled machines.

5. General

Kits are put together to convert an Mk3/4 into an Mk5 Elektronikon (with Mk5 Graphic module) controlled compressor. The kits contain the basic components to do the conversion. The kits do not contain any body parts, so adaptation of the doors and/or bodywork has to be done on-site.

All kits will include the SMARTBOX kit :

- see chapter 13 to install the SMARTBOX (= PM 2946 1650 xx)
- for a detailed SMARTBOX installation instruction , refer to the PM 2946 1651 XX in the GBP
- for the SMARTBOX installation video , refer to the CTS video website



Before starting the upgrade, read this instruction attentively. Compare the original Mk3/4 configuration and settings with the Mk5 version and write down the differences. You might need to adapt the Mk5 standard program using the Speci5 program.



Special remark for a GA 90 VSD with serial number up till 492000:

It is not possible to change only the Mk3 controller. If the GA 90 VSD up till serial number All492000 needs to be upgraded, a "Spare Part Converter kit" will be necessary. VSD compressors equipped with a "Simovert converter" or a "Toshiba converter" cannot be upgraded.



Before starting the upgrade write down:

- all active counters (e.g. running hours, loaded hours, motor start, load relay dryers starts, fan starts, ...)
- service intervals (running hours and real time hour)



6. Safety precautions

To be read attentively and acted accordingly before installing, operating or repairing the unit.

These recommendations apply to machinery processing or consuming air or inert gas. Processing of any other gas requires additional safety precautions typical to the application which are not included herein.

In addition to normal safety rules which should be observed with stationary air compressors and equipment, the following safety directions and precautions are of special importance.

When operating this unit, the operator must employ safe working practices and observe all related local work safety requirements and ordinances.

The owner is responsible for maintaining the unit in a safe operating condition. Parts and accessories shall be replaced if unsuitable for safe operation.

Installation, operation, maintenance and repair shall only be performed by authorized, trained, competent personnel.

Any modification on the compressor or air dryer shall only be performed in agreement with Atlas Copco and under supervision of authorized, competent personnel.

If any statement in this book, especially with regard to safety, does not comply with local legislation, the stricter of the two shall apply.

These precautions are general and cover several machine types and equipment; hence some statements may not apply to the unit(s) described in this book.

6.1. Installation

Apart from general engineering practice in conformity with the local safety regulations, the following directives are specially stressed:

A compressor or air dryer shall be lifted only with adequate equipment in conformity with local safety rules.

Loose or pivoting parts shall be securely fastened before lifting. It is strictly forbidden to dwell or stay in the risk zone under a lifted load. Lifting acceleration and retardation shall be kept within safe limits.

Wear a safety helmet when working in the area of overhead or lifting equipment.

Any blanking flanges, plugs, caps and desiccant bags shall be removed before connecting up the pipes. Distribution pipes and connections shall be of correct size and suitable for the working pressure

Place the unit where the ambient air is as cool and clean as possible. If necessary, install a suction duct. Never obstruct the air inlet. Care shall be taken to minimize the entry of moisture with the inlet air

The aspirated air shall be free from flammable fumes or vapours, e.g. paint solvents, which can lead to internal fire or explosion

Air-cooled units shall be installed in such a way that an adequate flow of cooling air is available and that the exhausted air does not circulate back to the inlet.

Arrange the air intake so that loose clothing of people cannot be sucked in.

Ensure that the discharge pipe from the compressor to the after cooler, air dryer or air net is free to expand under heat and that it is not in contact with or close to flammable material.

No external force may be exerted on the air outlet valve; the connected pipe must be free of strain.

If remote control is installed, the unit shall bear an obvious sign reading:

DANGER: This machine is remotely controlled and may start without warning.

The operator has to make sure that the machine is stopped and that the isolating switch is open and locked before starting any maintenance or repair.

As a further safeguard, persons switching on remotely controlled units shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the start equipment.

On units with automatic start-stop system, a sign stating "This machine may start without warning" shall be attached near the instrument panel.

In multiple compressor systems manual valves shall be installed to isolate each compressor. Non-return valves (check valves) shall not be relied upon for isolating pressure systems.



Never remove or tamper with the safety devices, guards or insulations fitted on the unit. Every pressure vessel or auxiliary installed outside the unit to contain air above atmospheric pressure shall be protected by a pressure-relieving device or devices as required.

For water-cooled machines with water shut-off valves installed at compressor cooling water in- and outlet, the cooling water system has to be protected by a safety device with set pressure according to the maximum cooling water inlet pressure and physical location as mentioned in this book.

Pipe work or other parts with a temperature in excess of 80 degrees Celsius and which may be accidentally touched by personnel in normal operation shall be guarded or insulated. Other high-temperature pipe work shall be clearly marked.

If the ground is not level or can be subject to variable inclination, consult Atlas Copco.

The electrical connections shall correspond to the local codes. The units shall be grounded and protected against short circuits by fuses. An isolating switch must be installed near the machine, preferably a lockable type.

6.2. Operation

 Air hoses shall be of correct size and suitable for the working pressure. Never use frayed, damaged or deteriorated hoses. Use only the correct type and size of hose end fittings and connections. When blowing through a hose or air line, ensure that the open end is held securely. A free end will whip and may cause injury. Make sure that a hose is fully depressurized before disconnecting it.

Never play with compressed air. Do not apply it to your skin or direct an air stream at people. Never use it to clean dirt from your clothes. When using it to clean equipment, do so with extreme caution and use eye protection.

The compressor is not considered as capable of producing air of breathing quality. For breathing air quality, the compressed air must be adequately purified according to local legislation and standards.

Never operate the units when there is a possibility of taking in flammable or toxic fumes.

Never operate the units at pressures below or in excess of their limit ratings as indicated on the Principal Data sheet.

Keep all bodywork doors shut during operation. The doors may be opened for short periods only, e.g. to carry out checks. Wear ear protectors when opening a door.

People staying in environments or rooms where the sound pressure level reaches or exceeds 90 dB (A) shall wear ear protectors.

Periodically check that:

- a. All guards are in place and securely fastened
- b. All hoses and/or pipes inside the unit are in good condition, secure and not rubbing
- c. There are no leaks
- d. All fasteners are tight
- e. All electrical leads are secure and in good order
- f. Safety valves and other pressure-relief devices are not obstructed by dirt or paint
- g. Air outlet valve and air net, i.e. pipes, couplings, manifolds, valves, hoses, etc. are in good repair, free of wear or abuse

If warm cooling air from compressors is used in air heating systems, e.g. to warm up a workroom, take precautions against air pollution and possible contamination of the breathing air.

Do not remove any of, or tamper with, the sound-damping material.

For water-cooled machines with water shut-off valves installed at compressor cooling water in- and outlet, the operator must ensure that the cooling water system can't be blocked when operating the unit.

6.3. Maintenance

Maintenance and repair work shall only be carried out under supervision of someone qualified for the job.

- Use only the correct tools for maintenance and repair work.
- Use only genuine spare parts.
- All maintenance work, other than routine attention, shall only be undertaken when the unit is stopped, the main power supply is switched off and the machine has cooled down. Take positive precaution to ensure that the unit cannot be started inadvertently.

In addition, a warning sign bearing a legend such as "work in progress; do not start" shall be attached to the starting equipment.



- Close the compressor air outlet valve before connecting or disconnecting a pipe.
- Before removing any pressurized component, effectively isolate the unit from all sources of pressure and relieve the entire system of pressure.
- Never use flammable solvents or carbon tetrachloride for cleaning parts. Take safety precautions against toxic vapours
 of cleaning liquids.
- Scrupulously observe cleanliness during maintenance and repair. Keep dirt away by covering the parts and exposed openings with a clean cloth, paper or tape.

Never weld or perform any operation involving heat near the oil system. Oil tanks must be completely purged, e.g. by steam-cleaning, before carrying out such operations.

Never weld on, or in any way modify, pressure vessels.

If performing any operation involving heat, flames or sparks on a machine, the surrounding components shall first be screened with non-flammable material.

Whenever there is an indication or any suspicion that an internal part of a machine is overheated, the machine shall be stopped but no inspection covers shall be opened before sufficient cooling time has elapsed; this to avoid the risk of spontaneous ignition of the oil vapour when air is admitted.

Never use a light source with open flame for inspecting the interior of a machine, pressure vessel, etc.

Make sure that no tools, loose parts or rags are left in or on the unit.

All regulating and safety devices shall receive maintenance with due care to ensure that they function properly. They may not be put out of action.

Before clearing the unit for use after maintenance or overhaul, check that operating pressures, temperatures and time settings are correct and that the control and shut-down devices function correctly. If removed, check that the coupling guard of the compressor drive shaft has been reinstalled.

Every time the separator element is renewed, examine the discharge pipe and the inside of the oil separator vessel for carbon deposits; if excessive, the deposits should be removed.

Protect the motor, air filter, electrical and regulating components, etc. to prevent moisture from entering them, e.g. when steam-cleaning.

Make sure that all sound-damping material, e.g. on the bodywork and in the air inlet and outlet systems of the machine, is in good condition. If damaged, replace it by genuine Atlas Copco material to prevent the sound pressure level from increasing.

Never use caustic solvents which can damage materials of the air net, e.g. polycarbonate bowls.

The following safety precautions are stressed when handling refrigerant:

- **a.** Never inhale refrigerant vapours. Check that the working area is adequately ventilated; if required, use breathing protection.
- **b.** Always wear special gloves. In case of refrigerant contact with the skin, rinse the skin with water. If liquid refrigerant contacts the skin through clothing, never tear off or remove the latter; flush abundantly with fresh water over the clothing until all refrigerant is flushed away; then seek medical first aid.
- c. Always wear safety glasses.

Protect hands to avoid injury from hot machine parts, e.g. during draining of oil.

NOTE: With stationary machine units driven by an internal combustion engine, allowance has to be made for extra safety precautions, e.g. spark arrestors, fuelling care, etc. Consult Atlas Copco.

All responsibility for any damage or injury resulting from neglecting these precautions, or by non-observance of ordinary caution and due care required in handling, operating, maintenance or repair, even if not expressly mentioned in this book, will be disclaimed by Atlas Copco.





7. Upgrade kits and content

The following table gives an overview of the kits:

AC partnumber	Description
2230 5015 90	upgrade Mk3 to Mk5 GA 5-90 Fixed Speed
2230 5015 91	upgrade Mk4 to Mk5 GA 5-90 Fixed Speed & VSD
2230 5015 92	upgrade Mk3 to Mk5 GA 30-90 VSD
2230 5015 93	optional kit IO2 for GA 11-90 Fixed Speed & VSD
2230 5015 98	upgrade Mk1/2 to Mk5 GA 45-75 Fixed speed

7.1. Parts list 2230 5015 90 - Mk3 to Mk5 GA 5-90 Fixed speed

AC partnumber	Description	#	drwg / family	info	extra info
1900 5200 11	controller	1			Graphic
0147 1169 03	bolt	4			M4 x 8
0301 2315 00	washer	4			M4
0333 3214 00	lockwasher	4			M4
0261 2108 00	nut	6			M6
0301 2321 00	washer	6			M6
0333 3220 00	lockwasher	6			M6
1622 1290 00	label	1			for cut out
1622 1297 80	adapter	1			for mounting module
1088 0031 14	tool small	1			for cage clamp
1088 0031 15	tool big	1			for cage clamp
1088 0037 80	connector	1	1088 0037 00	input	2X28
1088 0037 81	connector	1	1088 0037 00	input	2X27
1088 0031 32	connector	1	1088 0031 00	output	2X30
1088 0031 26	connector	1	1088 0031 00	output	2X31
2230 0500 0x	Modem kit	1			SMARTbox
9845 0215 00	instruction	1			GBP instruction 2946 1255 XX

7.2. Parts list 2230 5015 91 - Mk4 to Mk5 GA 5-90 Fixed speed & VSD

AC partnumber	Description	#	drwg / family	info	extra info
1900 5200 11	controller	1			Graphic
1088 0037 80	connector	1	1088 0037 00	input	2X28
1088 0037 81	connector	1	1088 0037 00	input	2X27
1088 0031 32	connector	1	1088 0031 00	output	2X30
1088 0031 26	connector	1	1088 0031 00	output	2X31
9845 0215 00	instruction	1			GA 5 - 90



7.3. Parts list 2230 5015 92 - Mk3 to Mk5 GA 30-90 VSD

AC partnumber	Description	#	drwg / family	info	extra info
1900 5200 11	controller	1			Graphic
0147 1169 03	bolt	4			M4 x 8
0301 2315 00	washer	4			M4
0333 3214 00	lockwasher	4			M4
0261 2108 00	nut	6			M6
0301 2321 00	washer	6			M6
0333 3220 00	lockwasher	6			M6
1622 1290 00	label	1			for cut out
1622 1297 80	adapter	1			for mounting module
1088 0031 14	tool small	1			for cage clamp
1088 0031 15	tool big	1			for cage clamp
1088 0037 80	connector	1	1088 0037 00	input	2X28
1088 0037 81	connector	1	1088 0037 00	input	2X27
1088 0031 32	connector	1	1088 0031 00	output	2X30
1088 0031 26	connector	1	1088 0031 00	output	2X31
1089 0574 75	temperature sensor	2		sensor	TT 90 & TT 91
1622 3056 10	temperature cable	1		cable	cable for TT 11
2230 0500 0x	Modem kit	1			SMARTbox
9845 0215 00	instruction	1			GBP instruction 2946 1255 XX

7.4. Parts list 2230 5015 93 - Optional kit IO2 for GA 11-90 Fixed speed & VSD

To be ordered when extra in/outputs are required.

AC partnumber	Description	#	drwg / family	info	extra info
1088 0037 83	connector	1	1088 0037 00	3X33	
1088 0037 84	connector	1	1088 0037 00	3X35	
1088 0031 32	connector	1	1088 0031 00	3X30	
1088 0037 82	connector	1	1088 0037 00	3X34	
1900 5200 30	IO2	1		regulator	expansion module
1622 5099 03	IO2 cable	1		controller to IO2	communication cable
1622 0665 04	DIN rail	1		IO2	mounting rail

7.5. Parts list 2230 5015 98 - Mk1/2 to Mk5 GA 45-75 Fixed speed

AC partnumber	Description	#	drwg / family	info	extra info
1900 5200 11	controller	1			Graphic
0147 1169 03	bolt	4			M4 x 8
0301 2315 00	washer	4			M4
0333 3214 00	lockwasher	4			M4
0261 2108 00	nut	6			M6
0301 2321 00	washer	6			M6
0333 3220 00	lockwasher	6			M6
1622 1290 00	label	1			For cut out
1622 1287 00	label	1			For cut out without adapter
1622 1297 80	adapter	1			For mounting module
1088 0031 14	tool small	1			For cage clamp
1088 0031 15	tool big	1			For cage clamp
1089 0574 70	temperature sensor	1			Element outlet TT11
1089 0575 54	pressure sensor	2			El./compressor outlet PT11, 20
1622 3072 80	support	1			To mount PT11
0571 0035 82	nipple	1			To mount PT11
0574 8231 21	hose	1			To mount PT11
1079 5840 08	nipple	1			To mount PT11
0605 8350 62	nipple	1			To mount PT11
1622 3056 00	cable	2			cable for pressure sensor
1622 3056 10	cable	1			cable for temperature sensor
1088 0037 80	connector	1	1088 0037 00	input	2x28
1088 0037 81	connector	1	1088 0037 00	input	2x27
1088 0031 32	connector	1	1088 0031 00	output	2x30
1088 0031 26	connector	1	1088 0031 00	output	2x31
2230 0500 0x	Modem kit	1			SMARTbox
9823 0215 00	instruction	1			GBP instruction 2946 1255 XX



8. Mechanical changes



Check if the compressor is powerless! Disconnect the main switch.

8.1. Cubicle door

For the Mk1/2/3 to Mk5 conversion the cubicle door must be adapted on-site.

The Elektronikon Mk5 can be mounted in place of Mk3 as follows:

• Disconnect the Mk1/2/3 connectors and remove the Mk3 Elektronikon controller from the cubicle door.

Cut out a rectangle as marked on the label with 2 crossed lines and drill 6 holes of 7mm. Use label (1622 1290 00) for the correct position.

Mount the Mk5 module on adapter (1622 1297 80) using the M4 bolts and washers.

Mount this assembly on the cubicle door using the M6 nuts and washers.

8.2. Mk5 expansion module IO2

Use the DIN rail from the IO2 option kit to mount the expansion module in the cubicle.

8.3. Extra modification only for Mk1 and Mk2 units

- Replace pressure sensors PT11 and PT20 by sensors (1089 0575 54).
- Replace temperature sensor TT11 by sensor (1089 0574 70).
- Disconnect do not remove!! all other sensors and remove the sensor wiring.
- Route the new cables from the pressure sensors and the temperature sensor to the controller in the cubicle. The figure below shows the assembly of pressure sensor PT11 (element outlet).



- A. Pressure sensor (1089 0575 54)
- B. Support (1622 3072 80)
- C. Nipple (0571 0035 82)
- D. Hose (0574 8231 21)

• Use nipple (0605 8350 62) to install pressure sensor PT20 on the WSD.



9. Electrical changes



Check if the compressor is powerless! Disconnect the main switch.

9.1. Wiring tool Mk5 Wago connectors

Plier tool Grey WAGO connector



PART NUMBER: 2908 0093 00

DESCRIPTION:

> Wiring tool for grey WAGO cage clamp connectors

Tool Black WAGO connector



9.2. Service diagrams

Mk5 converted service diagrams are available for de different types of units, latest generation. These can be used as guidelines for functionality of the connections and the conversion.

AC partnumber	Description
9845 1600 01	Mk3 (low range) to Mk5 upgrades (GA 5-45) Fixed Speed
9845 1600 02	Mk3 (high range) to Mk5 upgrades (GA 30-90) Fixed Speed
9845 1600 03	Mk3 to Mk5 upgrade (GA 30-90) VSD
9845 1600 06	Mk1/2 to Mk5 upgrade (GA 45-75) Fixed Speed
9845 1600 41	Optional kit IO2 for GA 11-90
9845 1600 50	Mk4 to Mk5 upgrades (GA 5-22 Elektronikon I) Fixed Speed
9845 1600 51	Mk4 to Mk5 upgrades (GA 5-30 Elektronikon II) Fixed Speed
9845 1600 52	Mk4 to Mk5 upgrades (GA 30-90) Fixed Speed
9845 1600 53	Mk4 to Mk5 upgrades (GA 5-90) VSD

See also chapter 12.



9.3. Rewiring

- The sensor wires have to be equipped with new connectors. Check the relevant Mk5 converted service diagram for connecting these connectors.
- Adapt the numbering of the wires and the labels on the connectors corresponding the numbering on the Elektronikon Mk5.



In case of a full feature installation you have to make sure that the ambient sensor TT01 is present. If not, you have to install this sensor separately. Use sensor 1089 0574 73 and connect the wire harness on connector 2x27/5 and 2x27/6 from the Mk5 Elektronikon.

9.3.1 Rewiring Fixed Speed compressors

The following tables give you a guideline how to rewire.

Rewiring digital inputs

Mk1/2	Mk3 Low Range	Mk3 High Range	Mk4 5-22	Mk4 5-30	Mk4 30-90		Mk5	Extra info	I/O Mk5
Connector/pin	Connector/pin	Connector/pin	Connector/pin	Connector/pin	Connector/pin	to	Connector/pin		
2X1/4	2X4/1	2X9/1	2X9/4	2X9/13	2X9/13	=>	2X27/9	DI Supply	DI Supply
2X1/8	2X4/10	2X6/8 & 2X6/9*	2X9/2	2X9/7	2X9/7	=>	2X27/11	motor protection	DI 02
2X1/6	2X4/5	2X6/3	2X9/1	2X9/3	2X9/3	=>	2X27/12	emergency stop	DI 01
NA	2X4/8	2X6/10		2X9/8	2X9/9		0207/40	fault EWD B1 (GA 30-90)	DI 0.4***
2X1/10	2X4/6	2X6/4		2X9/5	2X9/5	=>	2827/13	remote L/UL (GA 5-30)	DI 04
2X1/9-2x1/10**	2X4/3-2x4/4**	2X6/1 or 2X6/2**	2X9/3	2X9/4	2X9/4	=>	2X27/14	remote start/stop	DI 03
2X1/3	2X1/1	2X1/1	2X9/6	2X9/1	2X9/1	=>	2X27/15	0	0
2X1/1	2X1/2	2X1/2	2X9/5	2X9/2	2X9/2	=>	2X27/16	24 VAC	24 VAC
2X1/4	2X4/1	2X9/1		2X9/13	2X9/13	=>	2X28/7	DI Supply	DI Supply
NA	2X4/6	2X6/4		2X9/5	2X9/5		2X28/9	remote L/UL (GA 30-90)	BI activit
NA	2X4/8			2X9/8	2X9/9	=>		fault EWD B1 (GA 15-30)	DI 06***
NA	2X4/7	2X65		2X9/6	2X9/6	=>	2X28/10	remote pressure sensing	DI 05
NA	2X4/9	NA		2X9/9	2X9/11	=>	2X28/11	Dp switch for integrated PD filter	DI 08
NA	2X4/9	NA		2X9/9	2X9/10	=>	2X28/12	Dp switch for integrated DD filter	DI 07
NA				2X9/10	2X9/12	=>	2X28/13	remote press selection	DI 10

* Protection contacts connected to 2X6/8 & 9 have to be wired in series and connected to 2X27/11 of the Mk5 controller.

Compressors with Mk1/2/3 have two push buttons: Remote start (Mk1/2: 2X1/19; Mk3 low range: 2X4/3, high range 2X6/1) and Remote programmed stop (Mk1/2: 2X1/10; Mk3 low range: 2X4/4, high range 2X6/2). Both buttons have to be replaced with a NO latching switch and connected as Remote start/stop to 2X27/14 of the Mk5 controller.



**



- if the contact is open, the compressor will stop running.
- if the contact is closed, the compressor will start running directly.



^{***} Depending on the GA-type, DI 04 and DI 06 will be Fault EWD or Remote load/unload Control mode selection (2X4/4) or control mode selection 1 & 2 (2X4/8 & 2X4/9) are changed by a software function of the Mk5 controller.

Rewiring digital outputs

Mk1/2	Mk3 Low Range	Mk3 High Range	Mk4 5-22	Mk4 II 5-30	Mk4 30-90		Mk5	Extra info	I/O Mk5
Connector/pin	Connector/pin	Connector/pin	Connector/pin	Connector/pin	Connector/pin	to	Connector/pin		
2x2/4	2X2/15	2X8/5	2X10/1	2X10/8	2X10/8	=>	2X30/1		KOA
2x2/8	2X2/14	2X8/6	2X10/2	2X10/9	2X10/9	=>	2X30/2	blocking relay	KUT
2x2/2	2X2/13	2X8/3	2X10/3	2X10/5	2X10/5	=>	2X30/3	aux. relay star	1400
2x2/5	2X2/12	2X8/4	2X10/4	2X10/6	2X10/6	=>	2X30/4	contactor	KU2
2x2/9	2X2/11	2X8/1	2X10/5	2X10/2	2X10/2	=>	2X30/5	aux. relay delta	K03
2x2/13	2X2/10	2X8/2	2X10/6	2X10/3	2X10/3	=>	2X30/6	contactor	KU3
2x2/20	2X2/8	2X7/17	2X10/7	2X11/1	2X11/1	ĥ	2X30/7	aux. relay load/unload	KOA
2x2/24	2X2/9	2X7/18	2X10/8	2X11/2	2X11/2	ĥ	2X30/8		NU4
	2X6/2	2X7/5	2X10/11	2X12/7	2X12/7	=>	2X30/9	aux. relay	K05
	2X6/3	2X7/6	2X10/12	2X12/8	2X12/8	=>	2X30/10	general shutdown	
	2X2/2	2X7/2	2X10/9	2X11/7	2X11/7	=>	2X30/11	ouv, rolov druor	KOG
	2X2/3	2X7/3	2X10/10	2X11/8	2X11/8	=>	2X30/12	aux. relay uryer	KU0
	3X4/2	2X7/11		2X12/1	2X12/1	=>	2X31/1	aux. relay	KOZ
	3X4/3	2X7/12		2X12/2	2X12/2	=>	2X31/2	operation	KU7
2x2/17	3X5/2	2X7/8		2X12/4	2X12/4	=>	2X31/3	aux. relay general warning	KOR
2x2/27	3X5/3	2X7/9		2X12/5	2X12/5	=>	2X31/4		NUO
						=>	2X31/5	aux. relay comp.	KOO
						=>	2X31/6	(option)	KUB

Rewiring analogue inputs

Mk1/2	Mk3 Low Range	Mk3 High Range	Mk4 5-22	Mk4 5-22 Mk4 5-30 Mk4 3			Mk5	Extra info	I/O Mk5
Connector/pin	Connector/pin	Connector/pin	ctor/pin Connector/pin Connector/pin t		to	Connector/pin			
2x3/X***	2X3/3	2X4/2	2X5/1	2X5/1	2X5/1	=>	2X27/1	temperature	TT 44
2x3/X***	2X3/4	2X4/1	2X5/2	2X5/2	2X5/2	=>	2X27/2	element outlet	11 11
	2X3/1	2X4/8*	2X5/3	2X5/3	2X5/3	=>	2X27/3	temperature LAT	TT 00
	2X3/2	2X4/7*	2X5/4	2X5/4	2X5/4	=>	2X27/4	dryer ID	11 90
				2X5/5	2X5/5	=>	2X27/5	ambient	TT 04
				2X5/6	2X5/6	=>	2X27/6	temperature	11.01
2x3/X***	2X3/6	2X5/3	2X5/5	2X5/7	2X5/7	=>	2X27/7		
2x3/X***	2X3/5	2X5/2	2X5/7	2X5/9	2X5/9	=>	2X27/8	delivery air	PT 20
2x3/X***	2X3/7	2X5/1	2X5/6	2X5/8	2X5/8	=>	2X27/10		
		2X5/6		2X5/10	2X5/10	=>	2X28/5		
		2X5/5		2X5/12	2X5/12	=>	2X28/6	DP oil separator	PDT 01
		2X5/4		2X5/11	2X5/11	=>	2X28/8		
2x3/X***						=>	2X28/5		
2x3/X***						=>	2X28/6	Element outlet	PT11
2x3/X***						=>	2X28/8		
		2X4/8*		3X6/1	3X6/1	=>	2X28/1	analing water in	TT 64**
		2X4/7*		3X6/2	3X6/2	=>	2X28/2	cooling water in	11 51
				3X6/3 3X6/3		=>	2X28/3	cooling water	TT 50**
				3X6/4	3X6/4	=>	2X28/4	out	11.52"*



- * Depending on the type of compressor with Mk3 controller, sensor TT 90 or TT 51 is connected to the connector pins 2X4/7 and 2X4/8 of the Mk5 controller.
- ** If TT 51 and TT 52 are not available, TT 53 and TT 54 (option energy recovery) can be connected to 2X28/1...4 of the Mk5 controller. In this case reprogramming the Mk5 settings is necessary: TT 51 → TT 53 and TT 52 →TT 54.
- *** Only for Mk1/2: route new cables and install new sensors.

Rewiring IO2 expansion module

To be ordered when extra in/outputs on the Mk5 Elektronikon are required.

Mk3 Low Range	Mk3 High Range	Mk4 11-22	Mk4 II 11-30	Mk4 II 30-90		Mk5	Extra info	I/O IO2
Connector/pin	Connector/pin	Connector/pin	Connector/pin	Connector/pin	to	Connector/pin		
			6X9/3	6X9/3	=>	3X33/4	K35 motor protection warning	DI 01
			6X9/4	6X9/4	=>	3X33/3	K34 motor protection shutdown	DI 02
			24V (1X5)	24V (1X5)	=>	3X35/23	supply	24 V
			0V (1X5)	0V (1X5)	=>	3X35/24	supply	0 V
			3X6/1	3X6/1	=>	3X35/1		
			3X6/2	3X6/2	=>	3X35/2	energy recovery in	11 55 (102)
			3X6/3	3X6/3	=>	3X35/3	operativ receivery out	TT 54 (IO2)
			3X6/4	3X6/4	=>	3X35/4	energy recovery out	11 34 (102)



9.3.2 Rewiring VSD compressors

Sensors and communication

Only for upgrade from Mk3 GA 30-90 VSD to Mk5 VSD:

- Replace temperature sensors TT 90 and TT 91 by screened temperature sensor (1089 0574 75), if not yet done.
- Replace the cable of temperature sensor TT 11 by cable (1622 3056 10), if not yet done.
- Only for Master drive converter type CUVC : change the bus address of the serial interface from 0 into 1. Consult ECB AII0113:
 - P053 = 6 parameter access by PMU and computer
 - P060 = 7 free access to all parameters
 - P700 i2 = 1 change bus address from 0 to 1
 - P060 = 1 parameter menu
 - P053 = 0 no access
- Only for Master Drive converter type VC-CU2 (older versions), change following parameters :
 - P683 i3 = 1 change bus address from 0 to1
 - P684 i3 = 19200 baud

Rewiring digital inputs

Mk3	Mk4		Mk5	Extra info	I/O Mk5
Connector/pin	Connector/pin	to	Connector/pin		
2X9/1	2X9/13	=>	2X27/9		DI Supply
2X6/9	2X9/8	=>	2X27/11	motor protection	DI 02
2X6/3	2X9/3	=>	2X27/12	emergency stop	DI 01
2X6/10	2X9/9	=>	2X27/13	fault electronic drain	DI 04
2X6/1 or 2X6/2**	2X9/4	=>	2X27/14	remote start/stop	DI 03
2X1/1	2X9/1	=>	2X27/15	supply	0 VAC
2X1/2	2X9/2	=>	2X27/16	supply	24 VAC
2X9/1	2X9/13	=>	2X28/7		DI supply
		=>	2X28/9		
		=>	2X28/10		
	2X9/11	=>	2X28/11	Dp switch for integrated PD filter	DI 08
2X6/8	2X9/10	=>	2X28/12	Dp switch for integrated DD filter	DI 07
	2X9/12	=>	2X28/13	Remote press selection	
	2X9/5	=>	2X28/14	OSCI overflow (OPTION)	DI 09

** Compressors with Mk3 high range have two push buttons (Remote start 2X6/1 and Remote programmed stop 2X6/2). The push buttons have to be replaced with a NO latching switch and connected as Remote start/stop to 2X27/14 of the Mk5 controller.



Rewiring digital outputs

Mk3	Mk4		Mk5	Extra info	I/O Mk5
Connector/pin	Connector/pin	to	Connector/pin		
2X8/5	2X10/8	=>	2X30/1	for control	KOA
2X8/6	2X10/9	=>	2X30/2	ian control	KU I
2X7/17	2X11/1	=>	2X30/7	blau off	KOA
2X7/18	2X11/2	=>	2X30/8		K04
2X7/5	2X12/7	=>	2X30/9	concerci okuteloum	KOE
2X7/6	2X12/8	=>	2X30/10	general shutdown	NUU
2X7/2	2X11/7	=>	2X30/11	da con	KOG
2X7/3	2X11/8	=>	2X30/12	ulyei	NUO
2X7/11	2X12/1	=>	2X31/1		K07
2X7/12	2X12/2	=>	2X31/2	manuavautomatic operation	K07
2X7/8	2X12/4	=>	2X31/3		KOR
2X7/9	2X12/5	=>	2X31/4	general Wathing	NU0
2X7/14	2X11/4	=>	2X31/5	VSD (comy Inter look)	KOO
2X7/15	2X11/5	=>	2X31/6	VSD (CONV. INTELIOCK)	NUS

Rewiring analogue inputs

Mk3	Mk4		Mk5	Extra info	I/O Mk5
Connector/pin	Connector/pin	to	Connector/pin		
2X4/2	2X5/1	=>	2X27/1	alament outlat	TT 11
2X4/1	2X5/2	=>	2X27/2		11.11
2X4/4	2X5/3	=>	2X27/3		TT 00
2X4/3	2X5/4	=>	2X27/4		11.90
2X4/8*	2X5/5	=>	2X27/5		TT 04
2X4/7*	2X5/6	=>	2X27/6	ambient temperature OR convener cabinet temperature	11.01
2X5/3	2X5/7	=>	2X27/7		
2X5/2	2X5/9	=>	2X27/8	Delivery air	PT 20
2X5/1	2X5/8	=>	2X27/10		
2X5/6	2X5/10	=>	2X28/5		
2X5/5	2X5/12	=>	2X28/6	DP oil separator	PDT 01
2X5/4	2X5/11	=>	2X28/8		
2X4/8*	3X6/1	=>	2X28/1		TT 54**
2X4/7*	3X6/2	=>	2X28/2	cooling water in	
	3X6/3	=>	2X28/3		
	3X6/4	=>	2X28/4	cooling water out	1152***

* For compressors with Mk3 controller: TT 01 for air cooled units, TT 51 for water cooled units.

** If TT 51 and TT 52 are not available, TT 53 and TT 54 (option energy recovery) can be connected to 2X28/1...4 of the Mk5 controller. In this case reprogramming the Mk5 settings is necessary: TT 51 → TT 53 and TT 52 →TT 54.



Rewiring IO2 expansion module

To be ordered when extra in/outputs on the Mk5 Elektronikon are required.

Mk3	Mk4		Mk5	Extra info	I/O IO2
Connector/pin	Connector/pin	to	Connector/pin		
	3X10/2	=>	3X30/1	anti condensation protection	KOA
	3X10/1	=>	3X30/2	and-condensation protection	N04
	4X5/2	=>	3X34/14	external encode control 4.20 mA	AIO 1
	4X5/1	=>	3X34/18	external speed control 4-20 mA	Gnd
7X1/1	24 V (1X5)	=>	3X35/23	supply	24 V
7X1/2	0 V (1X5)	=>	3X35/24	supply	0 V
	3X6/1	=>	3X35/1		
	3X6/2	=>	3X35/2	energy recovery in	11 53 (102)
	3X6/3	=>	3X35/3		
	3X6/4	=>	3X35/4	energy recovery out	11 54 (102)
2X4/6		=>	3X35/5	tomporature converter subicle	TT 01
2X4/5		=>	3X35/6	temperature converter cubicle	11.91

9.4. Download instruction

Due to the complexity of converter settings, new Mk5 Elektronikon data-files are available (see 9.4.2). For fixed speed compressors the latest data-files (1900 5211 00) can be downloaded and has to be modified in the field with Modi5 (see 9.4.1).

While downloading with Speci 5 program fill in:

• Serial number of the compressor

🔜 Speci5 2.7.0.0					
I Download	👔 Upload 📔 🖹 Program Settings 🛛 🔌 Tools 🗍 🕸 Info				
Configuration	📄 File 🛛 Licences 🛛 📈 Counters				
Machine ——					
Model:	GA75VSD 12 Generation:	1 - GA75V	SD Mk4 to Mk5 release 10/2004		
Serial Number:	API140600 GUID:	ed5057ef-4	64f-4e1c-9440-a4e16fb71794	Create GUID	
Family:	Mk5 upgrade on GA75-90VSD-MK4 Operating System:	190052306	3		
Program:	1900525281 - VSD Graphic 1.5.10.3				
Controller:	Graphic				
Display Configura	ation				
Languages:		ch	T	Info Text	
Units:	Bar *C. Micron. mm. I/s. little. kWh. \$			Default from Text Core	-
Parameter Config	guration				
	Cooling [COOL]	Air cooled [AIR]		•
	Electrical approval [EAPPR]	IEC [IEC]			•
	Supply voltage [MOVOL]	400 V (3 pł	n) [400V]		•
	Anti condensation motor (for VSD only) [ACONDMOTOR]	Do NOT ad	stivate this option!		•
	Energy recovery [ENREC]	Do NOT ad	stivate this option!		•
	External speed control [EXSPC]	Do NOT ac	stivate this option!		•
	Integrated filter kit [FIKIT]	Do NOT ad	stivate this option!		•
	Freeze protection [FREPRO]	Do NOT ad	stivate this option!		-
	High ambient temperature version [HAT]	Do NOT ad	stivate this option!		-
	Integrated dryer [IDRY]	Do NOT ac	stivate this option!		-
	OSCI (OSCI)	Do NOT at	tivate this option!		-
- k					
Downlo	oad to controller 🛛 😑 Download t	o file			



• All active counters: e.g. running hours , loaded hours, motor starts, load relay, dryers starts, fan starts, ...



Not entering serial number, running hours & service intervals in a proper way will influence appearance of the machine in SMARTLINK. Incorrect information will impact operational efficiency & customer satisfaction.

After downloading, check on module screen *if the correct service plan levels (running hours and real time hours) of the retrofitted unit are downloaded in the controller.

* Menu > Service plan > Service plan



9.4.1 Fixed speed compressors

Procedure

- Power the control circuit with an external power source, through T1.
- Check the connections on the transformer for connecting the desired supply voltage.
- Download the software into the Mk5 module, using the latest Speci5 program and the latest data file (1900 5211 00).
- Select the features and options that have possibly been installed correctly.
- Check noticed differences between Mk1/2/3/4 and Mk5 written down before starting the upgrade (see chapter 5).
- Use the latest Mk5 Modi5 software (1900 5270 02) to adapt the sensor and functionality settings, if necessary.
- File the special software version. Keep a file record on side with the machine and at the Customer Center. The archiving of the different downloaded programs for the different converted units per serial number has to be done on Customer Center level.

Dryer type



If on an Mk3 Elektronikon an optional dryer was installed without 'hot cast bypass valve': DO NOT select "I(F)D energy saving".

Digital inputs



Following digital inputs are not standard activated:

- Remote start / stop
- Remote pressure sensing
- Remote load /unload

To activate each input, select in Speci5 TOOLS > REMOTE CONTROL.

Special adaptations for Mk1/2 to Mk5 upgrades

On older GA 45-75 units with Mk1/2 controller, the sensor configuration and settings were different. (e.g. PT11 was used as a permissive start function on the element outlet pressure).

- Check noticed differences between Mk1/2 and Mk5 written down before starting the upgrade (see chapter 5).
- Program these settings in the Mk5.



The following documents show programmable settings used on these units:

• GA 45/55/75 - 7,5/10/13bar (sensors)

					SOFTWARE LIM	ITS - PROGRA 11TS - MPK G	MEERGRENZEN	
Item		Sensor/Voeler	Codes	Lower limit Ondergrens	Lower Limit Ondergrens	Factory setting Fabrieksinstelling	Upper Limit Bovengrens	Upper Limit Bovengrens
Cut-out pressure Uitschakeldruk GA45/55/75-7.5 GA45/55/75-10 GA45/55/75-13	(bar)	PT20	1	4.5 4.5 4.5	4.5 4.5 4.5	7 9.5 12.5	7.5 10 13	16 16 16
Press.differential Druk differentieel	(bar)		2	0. T	đ. r	0.6	1.5	4.0
Element uitlaat temperatuur Element outlet temperature TUV	(°C)	1177	6	80 80	80 80	100 100	110 100	120 120
_AanLooptijd in Y Starting time in Y	(sec)		8	0	10	10	20	30 —
Overschakeltijd tussen Y en D Transition time from Y to D	(sec)			0.00		0.00		0.10
Belastingsvertraging Loading delay	(sec)		9	0	0	0	20	30
Aantal starten per uur Number of starts per hour			10	0	0	10	10	15
Element uitlaat stort niveau Element outlet stort level	(bar)	PT11		0		2		16
Minimum stop tijd Minimum stop time	(sec)			5		20		30
El.uitl.temp.shutd vertraging El.outl.temp.shutd delay time	(sec)			0		0		10



				50FTWARE LIM	ITS - PROGRA MITS - MPK G	MMEERGRENZEN RENZEN]	
Item	Sensor/Voeler	Codes	Lower Limit Ondergrens	Lower Limit Ondengrens	Factory setting Fabrieksinstelling	Upper Limit Bovengrens	Upper Limit Bovengrens
Cut-out pressure (psi) Uitschakeldruk GA45/55/75-100 GA45/55/75-125 GA45/55/75-150 GA45/55/75-175	PT20	1	65 65 65 65	65 65 65 65	100 125 150 175	107 132 156 181	232 232 232 232 232
Press.differential (psi) Druk differentieel		2	1	1	9	22	58
Element uitlaat temperatuur (F) Element outlet temperature TUV	TT11	6	176 176	176 176	212 212	230 212	248 248
Aanlooptijd in Y (sec) Starting time in Y		8	0	10	10	20	30 —
Overschakeltijd tussen Y en D Transition time from Y to D			0.00		0.00		0.10
Belastingsvertraging (sec) Loading delay		9	0	0	0	20	30
Aantal starten per uur Number of starts per hour		10	0	0	10	10	15
Element uitlaat start niveau Element outlet start level (psi)	PT11		0		30		232
Minimum stop tijd (sec) Minimum stop time			5		20		30
El.uitl.temp.shutd vertraging _(sec) El.outl.temp.shutd delay time			0		0		10



9.4.2 VSD compressors

Mk5 data files are available for upgrades VSD compressors in the LN Elektronikon database.

Selection of data files

Туре	VSD	Max speed range	Country		T03		Database	Product Family	Model	Description
GA5VSD	SMM				Ambient temp.	=>	9845160121 ed00	Mk5 upgrades	GA5VSD	GA5-7 VSD 03-2006
GA7VSD	SMM	3930rpm			Ambient temp.	=>		on GA5- 11VSD Mk4	GA7VSD	GA5-7 VSD 03-2006
GA7VSD	SMM	4110rpm			Ambient temp.	=>			GA7V_9	GA7 VSD 10/2005
GA11VSD	SMM				Ambient temp.	=>			GA11VSD	GA11 VSD 02/2005
GA15VSD	SMM				Not used	=>	9845160122	Mk5	GA15VSD	GA15-18 VSD 05/2007
GA15VSD	SMM		JPN		Not used	=>	ed00	upgrades on GA15- 30VSD Mk4	GA15VSD_08	GA15-22 VSD Japan 10/2005
GA18VSD	ABB				Not used	=>			GA18VSD	GA18 VSD 7/2003
GA18VSD	SMM				Not used	=>			GA18VSD_08	GA15-18 VSD 05/2007
GA18VSD	WEG				Not used	=>			GA18VSD_BR	GA18-30 VSD 12/2004
GA22VSD	SMM		JPN		Not used	=>			GA22VSD_08	GA15-22 VSD Japan 10/2005
GA22VSD	WEG				Not used	=>			GA22VSD_BR	GA18-30 VSD 12/2004
GA30VSD	SMM				Convert cab.temp.	=>			GA30VBR_08	GA30 VSD (Siemens)
GA30VSD	SMM				Not used	=>			GA30VSD	GA18-30 VSD 12/2004
GA30VSD	ABB				Not used	=>			GA30VSD_08	GA30 VSD (ABB) 7/2003
GA30VSD	WEG				Not used	=>			GA30VSD_BR	GA18-30 VSD 12/2004
GA37VSD	WEG				Ambient temp.	=>	9845160123 ed00	Mk5 upgrades	GA37VB_08	GA37VSD Brasil upgrade Mk4 release > 11/2005
GA37VSD	SMD CUVC	4830rpm			Convert cab.temp.	=>		on 37-45- 50-55VSD Mk4	GA37VSD	GA37VSD upgrade B+ Mk4 < 7/2003
GA37VSD	SMM				Ambient temp.	=>			GA37VSD_08	GA37VSD upgrade Mk4 release >11/2005
GA37VSD	SMD CUVC	5200rpm			Convert cab.temp.	=>			GA37VSD_1	GA37VSD upgrade Mk4 release <11/2005
GA37VSD	SMM			MAS*	Ambient temp.	=>			GA37VSD_12	MASGA37VSD upgrade Mk4 release > 11/2005
GA37VSD	WEG				Convert cab.temp.	=>			GA37VSD_BR	GA37VSD Japan upgrade Mk4 release < 11/2005
GA45VSD	WEG				Ambient temp.	=>			GA45VB_08	GA45VSD Brasil upgrade Mk4 release >11/2005
GA45VSD	SMM				Ambient temp.	=>			GA45VSD_08	GA45VSD upgrade Mk4 release >11/2005
GA45VSD	SMD CUVC				Convert cab.temp.	=>			GA45VSD_1	GA45VSD upgrade Mk4 release <11/2005
GA45VSD	SMM			MAS*	Ambient temp.	=>			GA45VSD_12	MASGA45VSD upgrade Mk4 release >11/2005
GA50VSD	SMD				Convert cab.temp.	=>			GA50VSD	GA50VSD upgrade B+ and Mk4 release 7/2003
GA50VSD	WEG				Convert cab.temp.	=>			GA50VSD_BR	GA50VSD Brasil upgrade Mk4 release 7/2003
GA55VSD	WEG				Ambient temp.	=>			GA55VB_08	GA55VSD Brasil upgrade Mk4 release >11/2005
GA55VSD	SMM				Ambient temp.	=>			GA55VSD_08	GA55VSD upgrade Mk4 release >11/2005
GA55VSD	SMD CUVC				Convert cab.temp.	=>			GA55VSD_1	GA55VSD upgrade Mk4 release <11/2005
GA55VSD	SMM			MAS*	Ambient temp.	=>			GA55VSD_12	MASGA55VSD upgrade Mk4 release >11/2005



Туре	VSD	Supply voltage	Max speed range		Т03		Database	Product family	Model	Description
GA75VSD	WEG		3000		Ambient temp	=>	9845160120 ed00	Mk5 upgrades	GA75VBR_08	GA75VSD Brasil Mk4 to Mk5 release 6/2005
GA75VSD	SMM		3000		Ambient temp	=>		on GA 75- 90 VSD Mk4	GA75VSD_08	GA75VSD Mk4 to Mk5 release 6/2005
GA75VSD	ABB	380/400/ 460/500	2700		Not used				GA75VSD	GA75VSD Mk4 to Mk5 upgrades released B+
GA75VSD	ABB	200/230/ 575	2700		Not used	=>			GA75VSD_1	GA75VSD Mk4 to Mk5 release 7/2003
GA75VSD	ABB	380/400/ 460/500	2850		Not used	=>			GA75VSD_1	GA75VSD Mk4 to Mk5 release 7/2003
GA75VSD	SMM	380/400/ 460	2850		Not used	=>			GA75VSD_12	GA75VSD Mk4 to Mk5 release 10/2004
GA90VSD	SMM	380/400/ 460			Not used	=>			GA90_12	GA90VSD Mk4 to Mk5 release 10/2004
GA90VSD	WEG				Not used	=>			GA90VBR_08	GA90VSD Brasil Mk4 to Mk5 release 6/2005
GA90VSD	SMM				Ambient temp	=>			GA90VSD_08	GA90VSD Mk4 to Mk5 release 6/2005
GA90VSD	ABB				Not used	=>			GA90VSD_1	GA90VSD Mk4 to Mk5 release 7/2003
GA75VSD	SMM			MAS*	Ambient temp	=>			MPGA75V_09	MASGA75VSD Mk4 to Mk5 release 6/2005

Unit	VSD		Т03		Database	Product family	Model	Description
GA30VSD	SMM		Convert cabinet temp	=>	9845160124 ed00	Mk5 upgrade on	GA30VSD	GA30VSD upgrade Mk3 (Siemens)
GA30VSD	SMD CUVC		Convert cabinet temp	=>		GA 37-45- 50-55-75-90 VSD Mk3	GA30VSD	GA30VSD upgrade Mk3 (Siemens)
GA37VSD	SMM		Convert cabinet temp	=>			GA37VSD	GA37VSD upgrade Mk3 (Siemens)
GA37VSD	SMD CUVC		Convert cabinet temp	=>			GA37VSD	GA37VSD upgrade Mk3 (Siemens)
GA50VSD	SMM		Convert cabinet temp	=>			GA50VSD	GA50VSD upgrade Mk3 (Siemens)
GA50VSD	SMD CUVC		Convert cabinet temp	=>			GA50VSD	GA50VSD upgrade Mk3 (Siemens)
GA75VSD	ABB		Not used	=>			GA75VSD	GA75VSD upgrade Mk3 (ABB)
GA75VSD	SMM		Not used	=>			GA75VSD	GA75VSD upgrade Mk3 (ABB)
GA90VSD	SMM		Convert cabinet temp	=>			GA90VSD	GA90VSD upgrade Mk3 (Siemens)
GA90VSD	SMD CUVC		Convert cabinet temp	=>			GA90VSD	GA90VSD upgrade Mk3 (Siemens)
GA90VSD	SMM		Not used	=>			GA90VSD_1	GA90VSD upgrade Mk3 (ABB)
GA90VSD	ABB		Not used	=>			GA90VSD_1	GA90VSD upgrade Mk3 (ABB)

* : MARINE AIR SOLUTION

**: ABB ACS 600/800

SMD Siemens Master Drive

SMM Siemens Micro Master



Download procedure

• Power the control circuit with an external power source, through T1.

Check the connections on the transformer for connecting the desired supply voltage.

Open the latest Speci5 program.

Open the correct database (see tables above) and select the correct model, features and options.

Example:

Upgraded unit = GA 75 VSD Mk4 Elektronikon, with SMM convertor and TT03 used as ambient temperature

→ database needed: 9845 1601 20 → model: GA 75 VSD_08

GA75VSD	WEG				Not used	=>	9845 1601 20 ed.00	1601 20 Mk5 ed.00 upgrades on GA75- 90VSD Mk4	GA75VBR_08	GA75VSD Brasil Mk4 to Mk5 release 6/2005
GA75VSD	SMM				Ambient temp	=>			GA75VSD_08	GA75VSD Mk4 to Mk5 release 6/2005
GA75VSD	ABB	200/230/575			Not used				GA75VSD_1	GA75VSD Mk4 to Mk5 release 7/2003
GA75VSD	ABB	380/400/460 /500			Not used	=>			GA75VSD_1	GA75VSD Mk4 to Mk5 release 7/2003
GA75VSD	SMM	380/400/460			Not used	=>			GA75VSD_12	GA75VSD Mk4 to Mk5 release 10/2004
GA90VSD	SMM	380/400/460			Not used	=>			GA90-12	GA90VSD Mk4 to Mk5 release 10/2004
GA90VSD	WEG				Not used	=>			GA90VBR_08	GA90VSD Brasil Mk4 to Mk5 release 6/2005
GA90VSD	SMM				Ambient temp	=>			GA90VSD_08	GA90VSD Mk4 to Mk5 release 6/2005
GA90VSD	ABB				Not used	=>			GA90VSD_1	GA90VSD Mk4 to Mk5 release 7/2003
GA75VSD	SMM			MAS*	Not used	=>			MPGA75V_09	MASGA75VSD Mk4 to Mk5 release 6/2005



10. Powerless test instruction

10.1. First step

Make sure the compressor is powerless! Disconnect the power switch.

Use the original service diagram and the conversion lists.

10.2. Adapted connections

Special attention for adapted connections must be given to: (if present)

- Emergency stop contact
- Overload motor contact
- Overload fan motor contact
- Temperature sensor element outlet
- Temperature sensor LAT drier
- Temperature sensor converter (if present)
- Pressure sensor delivery air
- Pressure sensor DP oil separator

Only for VSD's:

- If temperature sensor element outlet is screened
- If temperature sensor LAT dryer is screened
- If temperature sensor converter is screened (if present)

10.3. Double-check

Go for the second time through the conversion lists and check:

- If you have put the right wire on the right terminal
- If you have made a correct connection
- If the terminal is fixed in the Mk5 Elektronikon



11. Powered test instruction

11.1. First step

• Make sure the compressor is powered. Connect the main switch.

Do not push the start button at this moment.

Use the original service diagram and the conversion lists.

11.2. Sensor + input test

- Check all analogue inputs for their correct read out and connecting.
 - Disconnect, one by one, the connectors from each sensor.
 - Check if the Mk5 display gives the message 'sensor error'.

Check all safety devices for their functionality.

• Simulate temperature- and pressure warnings and shutdowns.

Check all digital inputs with the appropriate message on the MK5.

11.3. Additional test for VSD compressors with serial number All351580 or higher

A Siemens converter (if installed) has one extra temperature sensor.

• Try to warm up the sensor of the converter by holding the sensor in your hand.

Look at the display if the right temperature sensing value changes.

Connect the sensor back to the converter.

11.4. Start with the power lines connected

- Start the compressor, keeping one hand on the emergency stop button.
- Check if the compressor is running normal.
- Check the read out on the MK5.

Put the correct upgrade service diagram and this instruction next to the original in the cubicle.



12. Service diagrams







12.2. 9845 1600 02 - Upgrade Mk3 to Mk5, GA 30-90, fixed speed







12.3. 9845 1600 03 - Upgrade Mk3 to Mk5, GA 30-90 VSD

























12.8. 9845 1600 52 - Upgrade Mk4 to Mk5, GA 30-90, fixed speed





12.9. 9845 1600 53 - Upgrade Mk4 to Mk5, GA 5-90 VSD





13. Installation of SMARTBOX



Remove covers.



Determine antenna position. The position should be:

- on a single metal sheet.
 - close enough to the electrical cubicle for the length of the antenna cable.



Position should be equally divided.



Drill hole. Work in a clean way, collect and remove all particles and dust.



Remove burrs.



Guide antenna cable through the hole.



Mount antenna.





Mount the antenna on the roof using the delivered tooth lock washer. This washer will remove the paint to have a good earth/ground connection. The tooth lock washer has only one side with sharp edges. It is important that the sharp side is positioned towards the painted roof.

This is important to achieve a good network sensitivity and to avoid interferences that may have an impact on other electronic equipment. Using this improves safety.



Guide through compressor towards electrical cubicle. Routing: use available cutouts as much as possible.



There may be no interference with other cables.



Drill hole: position.





Drill hole: work in a clean way, make sure the electrical cubicle is free of iron







Mount cable gland.



Mount SMARTBOX.

particles and dust.



Mount 24VAC-VDC power supply. Connect **SMART**BOX to power supply.



Plug 24VAC connector in power supply. Wire connector to 24VAC transformer connection.



Connect antenna cable.



Antenna cable is clear from other cables, without interference.



Connect ethernet cable to Elektronikon.



Clean the unit.



Power on.



Check the LED's. Startup takes max. 15 minutes.





Green LED flashing or always on: communication with Elektronikon = OK.



If Red LED is always ON = NOT OK!



Yellow LED flashing or always on: communication with Elektronikon = OK.



The unit is ready for **SMART**LINK.



Red LED flashing every 2 sec.: mobile communication = OK.

