1. GENERALITIES ....................................................................................................................1
  1.1 OBJECTIVE.....................................................................................................................1
  1.2 CONCERNED PRODUCTS..............................................................................................1
  1.3 PRODUCT DESIGN AND MANUFACTURING...............................................................1
  1.4 EXCHANGE AND REPAIR..........................................................................................1
  1.5 ASSISTANCE................................................................................................................3

2. REQUIRED ABILITIES - TRAINING ..............................................................................4
  2.1 REQUIRED ABILITIES.................................................................................................4
  2.2 TRAINING....................................................................................................................4

3. DOCUMENTATION.........................................................................................................7
  3.1 CATALOGUE....................................................................................................................7
  3.2 OPERATING GUIDE........................................................................................................7
  3.3 M.I.T. INTRANET.............................................................................................................7
  3.4 B.E.S.T. “DATABASE OF EXPERIMENTS FOR SERVICES AND TECHNICAL ASSISTANCE” .........................................................7

4. REPAIR DEPARTMENT RESOURCES ...........................................................................8
  4.1 EQUIPMENT, MEASURING DEVICES AND TOOLS ......................................................8
  4.2 TEST Benches.................................................................................................................9
  4.3 DIAGNOSTIC HELP TOOLS – STANDARD SUB-ASSEMBLIES ....................................9

5. SPARE PARTS................................................................................................................10
  5.1 LIST OF SPARE PARTS................................................................................................10
  5.2 SUPPLY OF SPARE PARTS..........................................................................................12

6. PACKING........................................................................................................................13
  6.1 PACKING AVAILABILITY.............................................................................................13
  6.2 PACKING CAUTIONS....................................................................................................13

7. CONFIGURATION OF PRODUCTS..................................................................................14
  7.1 CONFIGURATION BACKUP........................................................................................14
  7.2 CONFIGURATION RELOADING..................................................................................14

8. TROUBLESHOOTING ......................................................................................................15
  8.1 DRIVE IDENTIFICATION..............................................................................................15
  8.2 ANALYSIS OF THE DRIVE USE AND ENVIRONMENT................................................15
  8.3 DRIVE VISUAL CONTROL............................................................................................15
  8.4 BREAKDOWN SEARCH FROM THE DISPLAYED FAULT..............................................16
  8.5 POWERS FROM 0.37 TO 7.5 KW – 230 V OR 400 V .................................................19
  8.6 POWERS 11 & 15 KW - 400 V ..................................................................................20

9. ASSISTANCE TO REPAIR.............................................................................................21
  9.1 CONTROL OF THE VARIOUS PARAMETERS OR FUNCTIONS - CALIBRATION ................21
  9.2 DISMANTLING / REASSEMBLY MANUALS FOR SUB-ASSEMBLIES AND COMPONENTS ..........................................................21

10. QUALITY SYSTEM.......................................................................................................22
  10.1 REPAIR VALIDATION PROCEDURE.........................................................................22
  10.2 REPAIR BRIEFING....................................................................................................22
  10.3 QUALITY REPORTING TO DAS CI..........................................................................22
1. Generalities

1.1 Objective

The present document is about the policy and resources to implement for on-site repair of the Altivar 18.

This repairing is carried out with the replacement of elements supplied by SCHNEIDER. It is exclusive to the "Transparency Contract" project. There is a local responsible of this special offer in the countries that have signed this contract.

1.2 Concerned products

This document concerns the ATV18 of following calibre:

<table>
<thead>
<tr>
<th>Size 1</th>
<th>ATV18U09M2 0.37kW-230V</th>
<th>ATV18U18M2 0.75kW-230V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size 2</td>
<td>ATV18U29M2 1.5kW-230V</td>
<td>ATV18U18N4 0.75kW-400V</td>
</tr>
<tr>
<td></td>
<td>ATV18U29N4 1.5kW-400V</td>
<td></td>
</tr>
<tr>
<td>Size 3</td>
<td>ATV18U41M2 2.2kW-230V</td>
<td>ATV18U54M2 3kW-230V</td>
</tr>
<tr>
<td></td>
<td>ATV18U72M2 4kW-230V</td>
<td>ATV18U41N4 2.2kW-400V</td>
</tr>
<tr>
<td></td>
<td>ATV18U54N4 3kW-400V</td>
<td>ATV18U72N4 4kW-400V</td>
</tr>
<tr>
<td>Size 4</td>
<td>ATV18U90M2 5.5kW-230V</td>
<td>ATV18D12M2 7.5kW-230V</td>
</tr>
<tr>
<td></td>
<td>ATV18U90N4 5.5kW-400V</td>
<td>ATV18D12N4 7.5kW-400V</td>
</tr>
<tr>
<td>Size 5</td>
<td>ATV18D16N4 11kW-400V</td>
<td>ATV18D23N4 15kW-400V</td>
</tr>
</tbody>
</table>

1.3 Product design and manufacturing

All the modules, accessories and software are designed and developed by Schneider Electric on its own or in co-operation with selected partners.

At each design and manufacturing step, the products are processed with great care. To guarantee a high quality level, the products are thoroughly monitored.

1.4 Exchange and repair

The ALTIVAR 18 is of after-sale category 2, but the countries locally organised to provide a first level of expertise may repair the drives and will be allowed to access to the spare parts.

In case of major defect or for addition of new functions, the updating of products will be necessary. In this case, information will be transmitted to all SCHNEIDER networks.

The time of delivery for the repaired or new element will be given by the dealer or the -S- commercial unit. The quality of the replacement service is based on the stocks constituted at Evreux, in the branches and by the official dealers.
Definition of the after-sale categories:

- **APV2**
  After-sale category 2: Not repairable drive, to be replaced by a new drive free of charge when under guarantee. Exchanged by a new drive at a special rate after the guarantee period.

- **APV3**
  After-sale category 3: Repairable product with standard exchange.
  Under guarantee: Replaced free of charge by a new product.
  After the guarantee period: Delivery of a recycled product at a special rate.
  This product symbol is marked out in the Evreux product file by R or TR.

- **APV4**
  After-sale category 4: Product to be repaired. They are marked out in the product file by the symbol completed by TA. The indicated price is a set price for reparation of a product sent back to the factory.
  Under guarantee: Product repaired free of charge.
  After the guarantee period: Product repaired and invoiced.
1.5 Assistance

1.5.1 On-site intervention
The customer's on-site assistance will be ensured by the technicians and engineers of the
SCHNEIDER "services" teams of the country of which the customer depends on.

1.5.2 Technical assistance
The first level of telephone assistance is ensured by the technicians of the SCHNEIDER agencies
branches from which the customer depends on.
The second level of telephone assistance is done through the direct line of the
Global Help Desk:  Tel: +33 (0)1 41 39 39 00 – Fax: +33 (0)1 41 39 37 72
ccmail: [CI-GHD], rueil-gare
E-mail: rueil-gare_[ci-ghd]@mail.schneider.fr

1.5.3 Returns from customers
Returns of faulty materials (complete products or sub-assemblies) are carried out according to the
proceedings defined in the Transparency Contract.

1.5.4 Stock updating
In case of major defect or for addition of new functions, the updating of products will be necessary.
In this case, information will be transmitted to all SCHNEIDER networks.
2. Required abilities - Training

2.1 Required abilities

The Altivar repair has to be carried out by experienced technicians:

– Knowledge of the behaviours of the rotating machines driven by electronic Speed Drives.
– Principle of Power Controls and electronic Controls.
– Expertise on tools such as "Pc's, Oscilloscope, Multimeter, etc."

The qualified maintenance responsible will implement the procedure described in this manual for equipment and people protection.

– Read, understand and follow the instructions and cautions described in this manual or other quoted manuals.
– Use in a professional way the necessary tools.

2.2 Training

2.2.1 Customer's training

The Schneider Training Institute (S.T.I.) organises training sessions on speed drives in order to know how to implement these products. For more information, please contact the S.T.I. by phone (+33 (0)1 41 39 60 00) or by fax (+33 (0)1 41 39 60 72.).

2.2.2 Internal training

Many training sessions about the choice and implementation of speed drives are available. The datasheet describing the course contents are to be found in the appendixes.

For more information, please read the guide of DAS CI training sessions.

2.2.3 After-sale service training

This training session is only reserved to the on-site operators. It requires a fair knowledge of the product and its applications (ventilation, pumping, convoying, etc.).

For more information, please contact the DAS CI training group Manager.

2.2.4 Training assistance

There is a training assistance available on:

– Intranet:
  Go online to the DAS CI server.
  Choose “Technical training”

– CDROM referenced “CIFOR”
  To be ordered at “Schneider Comm. Services” - Meylan / France
  Tel: +33 (0)4 76 60 59 17
     +33 (0)4 76 60 59 02
  Fax: +33 (0)4 76 60 67 32
Training courses given by the ISFs.

**Principles**

- **VI 200** *(variable speed control 5 days)*
- **VEG2** *(variable speed controller solutions 5 days)*
- **VM8** *(Altivar ATV58 3 days)*
  - Altivar ATV62 expert (and LH4N) 1 day
- **VM6** *(Altivar ATV66 3 days)*
  - Altivar ATV66 (and ATV08) 1 day
- **VE6** *(Altivar ATV66 FVC 2 days)*
  - Altivar ATV66 (and ATV66FVC) 1 day
- **EXP46** *(Altistart ATS46 expert 1 day)*
- **EXP18** *(Altivar ATV18 expert (and ATV08) 1 day)*
- **EXP58** *(Altivar ATV58 expert 1 day)*
- **EXP66** *(Altivar ATV66 expert (and ATV66FVC) 1 day)*
- **COM ATV** *(ATV 58, ATV 66 communication protocols 2 days)*
- **MCOM** *(Introduction to communication fielbuses 1 day)*
- **SAV** *(Altivar after sales expert 7 days)*
- **VMEX** *(variable speed controller maintenance 3 days)*

**Operation**

**Maintenance**

---

* *
ATV18 and ATV08 EXPERT

Training objectives

- To become an expert in the installation of Altivar ATV08 controllers (< 1kW) and ATV18 controllers (0.37 to 15 KW).

Knowledge required

- Knowledge of the main applications (cooling, pumping, handling).
- Thorough knowledge of power electronics.
- Knowledge of asynchronous motors.
- Good knowledge of speed drive products.
- Hands on experience.

COURSE CONTENTS

- Range.
- Technology.
- Performance.
- Protection.
- Client/sequence terminals.
- Functions.
- Options.
- Accessories.

DOCUMENTATION PROVIDED

ATV08 and ATV18 Training manuals.
Programming guide.

TEACHING NOTES

Simple speed controller, with basic functions which can be quickly understood and mastered.

Lectures : 70 %
Practical : 30 %

COURSE ORGANISER: SBS

LOCATION: RUEIL GARE

PRICE: Free

APPLICATION EQUIPMENT

Altivars ATV18 and ATV08.
3. Documentation

3.1 Catalogue
A specific Altivar 18 catalogue is available:

<table>
<thead>
<tr>
<th>REF</th>
<th>FRENCH</th>
<th>ENGLISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVDED296038FR</td>
<td></td>
<td>VVDED296039EN</td>
</tr>
</tbody>
</table>

3.2 Operating guide
A specific ATV18 operating guide is available:

ALTVAR 18  VVDED396037  N°: 75962  Available Evreux 2.

3.3 M.I.T. Intranet
This is a collection of technical information sheets covering the VVD products (software versions, application sheets).
These documents can be consulted on the IC SBU Intranet site.
Address : http://139.160.75.12
select : MIT : Technical information / VSD

3.4 B.E.S.T. “Database of Experiments for Services and Technical assistance”
B.E.S.T is composed of two databases:

- **Help Desk**
  - To ask for a personalised answer from the DAS to a precise enquiry.
  - A country to question its file of current or answered enquiries to have its status at the chosen instant, whenever the DAS is available or not.
  - To question the database of all the enquiries already asked to the DAS to find a possible answer or a clue.

- **Pro-Base**
  - Protected by a password.
  - Pro-base is the DAS-CI / Country “Transparency Contract” tool. It is the real-time information about the quality of products and applications to enable a reliable diagnostic and a quick answer to a customer's complaint.
4. Repair department resources

4.1 Equipment, measuring devices and tools

4.1.1 Necessary tools to repair speed drives

- set of magnetic flat-blade screwdrivers,
- set of magnetic cross-point screwdrivers,
- set of torx screwdrivers,
- set of metric socket spanners, 5.5 to 14 mm with -" pin,
- 2" extension for socket spanner ( " pin),
- 12" extension for socket spanner ( " pin),
- set of metric Allen keys, 2 to 14 mm,
- set of metric swivel Allen keys, 2 to 14 mm,
- torque spanner, 0.5 to 10 Nm,
- metric Allen key sockets, for torque spanner, 2 to 14 mm,
- cross-point driver bits, for torque spanner,
- flat-blade driver bits, for torque spanner,
- needle nose pliers,
- contact lubricant,
- set of flat spanners 5.5 to 19 mm,
- set of ring spanners 5.5 to 19 mm,
- wires cutter,
- plastic clamps,
- multimeter,
- ammeter clip,
- oscilloscope,
- lamp to check thyristors continuity,
- single-phase alternostat (500 VA) for a voltage variation from 200V AC to 530V AC,
- digital or rotating-loop multimeter,
- anti-static strap.

4.1.2 Tools and accessories specific to the ATV18

For an user-friendly repair:

- Use the PC link additional device (VW3A18104),
- PC.

The two floppy disks of the PC software enable the saving of customers' configurations. This CDROM is equipped with the SCALE18.EXE software to carry out the drive calibration.

Their use is described in the chapter 9 “assistance to repair”.
4.2 Test benches
After repair the drive has to be tested on-load on a test bench.
There is no bench test proposed by the DAS for this product.
The repair service may use the recommended connection sketch in the operating guide as a model
to carry out the tests.
The power supply has to be protected by a circuit-breaker.
A motor of same power as the drive power and a control box (potentiometer and commutator
FW/RV) are necessary.

4.3 Diagnostic help tools – Standard sub-assemblies
On this CDROM the DAS supplies VW3A18103 software to the Schneider repair centres to enable
them to calibrate the drive. A VW3A18104 serial link cable is required.
Its use is described in the chapter 9 “assistance to repair”.
## 5. Spare parts

### 5.1 List of spare parts

NB: Considering that only the geographical units are allowed to repair the ATV 18, these spare parts are not directly available for the customers.

### Spare parts Delivery code REFERENCE Article N°

**"Control" card for all calibre**

<table>
<thead>
<tr>
<th>Spare parts</th>
<th>Delivery code</th>
<th>REFERENCE</th>
<th>Article N°</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Control&quot; card for all calibre</td>
<td>T</td>
<td>VX4A181</td>
<td>076159</td>
</tr>
</tbody>
</table>

**"Filter" cards**

<table>
<thead>
<tr>
<th>Spare parts</th>
<th>Delivery code</th>
<th>REFERENCE</th>
<th>Article N°</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATV18U09M2</td>
<td>T</td>
<td>VX4A18101</td>
<td>076160</td>
</tr>
<tr>
<td>ATV18U18M2</td>
<td>T</td>
<td>VX4A18102</td>
<td>076161</td>
</tr>
<tr>
<td>ATV18U29M2</td>
<td>T</td>
<td>VX4A18103</td>
<td>076162</td>
</tr>
<tr>
<td>ATV18U41M2</td>
<td>T</td>
<td>VX4A18104</td>
<td>076163</td>
</tr>
<tr>
<td>ATV18U54M2, U72M2</td>
<td>T</td>
<td>VX4A18105</td>
<td>078302</td>
</tr>
<tr>
<td>ATV18U90M2, D12M2</td>
<td>T</td>
<td>VX4A18106</td>
<td>078303</td>
</tr>
<tr>
<td>ATV18U18N4, U29N4</td>
<td>T</td>
<td>VX4A18107</td>
<td>078304</td>
</tr>
<tr>
<td>ATV18U41N4, U54N4, U72N4</td>
<td>T</td>
<td>VX4A18108</td>
<td>078305</td>
</tr>
<tr>
<td>ATV18U90N4, D12N4</td>
<td>T</td>
<td>VX4A18109</td>
<td>078307</td>
</tr>
<tr>
<td>ATV18D16N4, D23N4</td>
<td>T</td>
<td>VX4A18110</td>
<td>078306</td>
</tr>
</tbody>
</table>

**"Power" sub-assemblies**

<table>
<thead>
<tr>
<th>Spare parts</th>
<th>Delivery code</th>
<th>REFERENCE</th>
<th>Article N°</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATV18U09M2</td>
<td>T</td>
<td>VX5A18U09M2</td>
<td>076170</td>
</tr>
<tr>
<td>ATV18U18M2</td>
<td>T</td>
<td>VX5A18U18M2</td>
<td>076171</td>
</tr>
<tr>
<td>ATV18U29M2</td>
<td>T</td>
<td>VX5A18U29M2</td>
<td>076173</td>
</tr>
<tr>
<td>ATV18U41M2</td>
<td>T</td>
<td>VX5A18U41M2</td>
<td>076175</td>
</tr>
<tr>
<td>ATV18U54M2</td>
<td>T</td>
<td>VX5A18U54M2</td>
<td>078308</td>
</tr>
<tr>
<td>ATV18U72M2</td>
<td>T</td>
<td>VX5A18U72M2</td>
<td>078309</td>
</tr>
<tr>
<td>ATV18U18N4</td>
<td>T</td>
<td>VX5A18U18N4</td>
<td>078310</td>
</tr>
<tr>
<td>ATV18U29N4</td>
<td>T</td>
<td>VX5A18U29N4</td>
<td>078311</td>
</tr>
<tr>
<td>ATV18U41N4</td>
<td>T</td>
<td>VX5A18U41N4</td>
<td>078312</td>
</tr>
<tr>
<td>ATV18U54N4</td>
<td>T</td>
<td>VX5A18U54N4</td>
<td>078313</td>
</tr>
<tr>
<td>ATV18U72N4</td>
<td>T</td>
<td>VX5A18U72N4</td>
<td>078314</td>
</tr>
<tr>
<td>Spare parts</td>
<td>Delivery code</td>
<td>REFERENCE</td>
<td>Article N°</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>“Power” cards</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATV18U90M2, D12M2</td>
<td>T</td>
<td>VX5A18U90M2</td>
<td>078315</td>
</tr>
<tr>
<td>ATV18D12M2</td>
<td>T</td>
<td>VX5A18D12M2</td>
<td>078316</td>
</tr>
<tr>
<td>ATV18U90N4</td>
<td>T</td>
<td>VX5A18U90N4</td>
<td>078317</td>
</tr>
<tr>
<td>ATV18D12N4</td>
<td>T</td>
<td>VX5A18D12N4</td>
<td>078318</td>
</tr>
<tr>
<td>ATV18D16N4</td>
<td>T</td>
<td>VX5A18D16N4</td>
<td>078319</td>
</tr>
<tr>
<td>ATV18D23N4</td>
<td>T</td>
<td>VX5A18D23N4</td>
<td>078320</td>
</tr>
<tr>
<td><strong>“Power” modules / IPM</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATV18U90M2, D12M2</td>
<td>T</td>
<td>VZ3IM6075M0618</td>
<td>076188</td>
</tr>
<tr>
<td>ATV18U90N4, D12N4</td>
<td>T</td>
<td>VZ3IM6050M1218</td>
<td>078321</td>
</tr>
<tr>
<td>ATV18D16N4, 23N4</td>
<td>T</td>
<td>VZ3IM6075M1218</td>
<td>078322</td>
</tr>
<tr>
<td><strong>Rectifiers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATV18U90M2, D12M2</td>
<td>T</td>
<td>VZ3DM6075M0818</td>
<td>076190</td>
</tr>
<tr>
<td>ATV18U90N4, D12N4, D16N4</td>
<td>T</td>
<td>VZ3DM6075M1618</td>
<td>078351</td>
</tr>
<tr>
<td>ATV18D23N4</td>
<td>T</td>
<td>VZ3DM6100M1618</td>
<td>078353</td>
</tr>
<tr>
<td><strong>Condenser sub-assemblies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATV18U90M2, D12M2</td>
<td>H</td>
<td>VY1ADC10118</td>
<td>078360</td>
</tr>
<tr>
<td>ATV18D12M2</td>
<td>H</td>
<td>VY1ADC10218</td>
<td>078361</td>
</tr>
<tr>
<td>ATV18U90N4, D12N4</td>
<td>H</td>
<td>VY1ADC10318</td>
<td>078357</td>
</tr>
<tr>
<td>ATV18D16N4</td>
<td>H</td>
<td>VY1ADC10418</td>
<td>078358</td>
</tr>
<tr>
<td>ATV18D23N4</td>
<td>H</td>
<td>VY1ADC10518</td>
<td>078359</td>
</tr>
<tr>
<td><strong>Load resistance sub-assemblies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATV18U90M2, D12M2</td>
<td>H</td>
<td>VY1ADR10118</td>
<td>078362</td>
</tr>
<tr>
<td>ATV18U90N4, D12N4</td>
<td>H</td>
<td>VY1ADR10218</td>
<td>076199</td>
</tr>
<tr>
<td>ATV18D16N4, D23N4</td>
<td>H</td>
<td>VY1ADR10318</td>
<td>076200</td>
</tr>
<tr>
<td><strong>Fans</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATV18U29M2, U29N4</td>
<td>H</td>
<td>VZ3V181</td>
<td>078365</td>
</tr>
<tr>
<td>ATV18U41M2, U54M2, U72M2, U41N4, U54N4, U72N4</td>
<td>H</td>
<td>VZ3V182</td>
<td>078367</td>
</tr>
<tr>
<td>5.5 &amp; 7.5 kW-230 V &amp; 5.5 – 7.5 –400 V</td>
<td>H</td>
<td>VZ3V183</td>
<td>078366</td>
</tr>
<tr>
<td>11 &amp; 15 kW-400 V</td>
<td>H</td>
<td>VZ3V184</td>
<td>020580</td>
</tr>
<tr>
<td><strong>Power connection sub-assemblies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATV18U90M2, D12M2</td>
<td>H</td>
<td>VW3A18801</td>
<td>078363</td>
</tr>
<tr>
<td>ATV18U90N4, D12N4</td>
<td>H</td>
<td>VW3A18802</td>
<td>076206</td>
</tr>
<tr>
<td>ATV18D16N4, D23N4</td>
<td>H</td>
<td>VW3A18803</td>
<td>076206</td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATV18U90M2, D12M2, U90N4, D12N4</td>
<td>M</td>
<td>VY1A18101</td>
<td>084687</td>
</tr>
<tr>
<td>ATV18U29M2, U18N4, U29N4</td>
<td>M</td>
<td>VY1A18102</td>
<td>084688</td>
</tr>
<tr>
<td>ATV18U41M2, U54M2, U72M2, U41N4, U54N4, U72N4</td>
<td>M</td>
<td>VY1A18103</td>
<td>084689</td>
</tr>
<tr>
<td>ATV18U90M2, D12M2, U90N4, D12N4</td>
<td>M</td>
<td>VY1A18104</td>
<td>084690</td>
</tr>
<tr>
<td>ATV18D16N4, D23N4</td>
<td>M</td>
<td>VY1A18105</td>
<td>084691</td>
</tr>
<tr>
<td><strong>Control support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATV18U90M2, D12M2, U90N4, D12N4</td>
<td>M</td>
<td>VY1A18106</td>
<td>084692</td>
</tr>
<tr>
<td>ATV18D16N4, D23N4</td>
<td>M</td>
<td>VY1A18107</td>
<td>084693</td>
</tr>
<tr>
<td><strong>Sides</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATV18U90M2, D12M2, U90N4, D12N4</td>
<td>M</td>
<td>VY1A18108</td>
<td>084694</td>
</tr>
<tr>
<td>ATV18D16N4, D23N4</td>
<td>M</td>
<td>VY1A18109</td>
<td>084695</td>
</tr>
</tbody>
</table>
5.2 Supply of spare parts

The operating guide is stored at Evreux.

The control cards are packed and sold in 5-piece quantity.

The power sub-assembly cards are individually packed and sold in 5-piece quantity.
6. Packing

6.1 Packing availability

6.2 Packing cautions
   The product has to be packed in its specific packing before being sent back to the customer.
7. Configuration of products

Before starting the diagnostic and/or repair, you have to backup the customer's configuration to restore it during product re-installation.

7.1 Configuration backup

Connect the PC link additional part to the drive and carry out the following sequence from the PC software:

- Connection to the drive
- File, Save as (example: Client 1.18c)

The configuration and adjustment parameters are saved.

7.2 Configuration reloading

Connect the PC link additional part to the drive and carry out the following sequence from the PC software:

- Connection to the drive
- File, Open the previously saved customer's file (example: Client 1.18c)

The configuration and adjustment parameters are restored.
8. Troubleshooting

8.1 Drive identification
Before starting the repair, note the following points:
- Drive voltage
- Drive calibre
- Software version
- Guarantee date

8.2 Analysis of the drive use and environment
- Get the maximum information from the customer
- Machine type, kinematic chain, neutral rate, etc.
- Equipment sketch: the connections of the control and power circuits have to comply with the recommended sketch indicated in the operating guide
- Drive use conditions: temperature, humidity, installation location, vibrations, pollution, CEM disturbed environment or network.
- Failure causes and fault code
- Status of logic inputs during the running phase generating the failure
- Check that the adjustments comply with the application
- Has the drive change solved the failure for the drives under guarantee?

8.3 Drive visual control
Detect possible drive deterioration:
- Mechanical piece (Example: fan, housing)
- Control card and/or Power card
  (example: blackened components due to overloading or starting)
- Connectors
- Wires
## 8.4 Breakdown search from the displayed fault

Faults that can be reset with the automatic restart function after fault clearance.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Clearance procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>OHF Over-Heat Fault</td>
<td>- too high I’t or</td>
<td>- Control the motor load, the drive ventilation and the environment. Wait for the</td>
</tr>
<tr>
<td>Drive overload</td>
<td>- too high drive temperature</td>
<td>cooling before starting again.</td>
</tr>
<tr>
<td>OLF Over-Load Fault</td>
<td>- Release due to too high motor I’t</td>
<td>- Check the motor thermal protection adjustment. Check the motor load. Wait for</td>
</tr>
<tr>
<td>Motor overload</td>
<td></td>
<td>the cooling before starting again.</td>
</tr>
<tr>
<td>OSF Over-voltage</td>
<td>- Network voltage too high</td>
<td>- Check the network voltage.</td>
</tr>
<tr>
<td>during steady state</td>
<td>- Disrupted network</td>
<td></td>
</tr>
<tr>
<td>or acceleration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USF Under-voltage</td>
<td>- Too weak network</td>
<td>- Check the voltage and the voltage parameter.</td>
</tr>
<tr>
<td></td>
<td>- Temporarily voltage drop</td>
<td>- Reset.</td>
</tr>
<tr>
<td></td>
<td>- Deteriorate load resistance</td>
<td>- Change the load resistance.</td>
</tr>
<tr>
<td>ObF Over-voltage</td>
<td>- Too brutal braking or driving load</td>
<td>- Increase the deceleration duration.</td>
</tr>
<tr>
<td>during deceleration</td>
<td></td>
<td>- Add a braking resistance if necessary.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Activate the brA function if suitable to the application.</td>
</tr>
</tbody>
</table>

Faults that cannot be automatically reset. The fault cause has to be suppressed before resetting by on / off operations.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Clearance procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCF Over-current fault</td>
<td>- Short circuit or earthing at the drive output</td>
<td>- With the drive disconnected, check the linking cables, the motor insulation and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the coupling state.</td>
</tr>
<tr>
<td></td>
<td>- Over-intensity in the braking resistance</td>
<td>- Check the resistance choice.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With the drive disconnected, check the linking cables, the resistance insulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and ohmic value.</td>
</tr>
<tr>
<td>DbF Overload of braking circuit</td>
<td>- Overstepping of the capacities of the braking circuit</td>
<td>- Check the braking resistance choice.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the resistance ohmic value.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Verify that the drive size complies with the application.</td>
</tr>
<tr>
<td>InF Internal fault</td>
<td>- Internal fault</td>
<td>- Check the environment (electromagnetic compatibility)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Send the drive back for control/repair.</td>
</tr>
<tr>
<td>TnF Self-setting fault</td>
<td>- Special motor</td>
<td>- Use the L or P law.</td>
</tr>
<tr>
<td></td>
<td>- Motor power not adapted to the drive</td>
<td></td>
</tr>
<tr>
<td>EEF - Internal fault</td>
<td>- Internal fault</td>
<td>- Send the drive back for control/repair.</td>
</tr>
</tbody>
</table>
Powers from 0.37 kW to 5.5 kW

Altivar 18 input - Backup of the customer's configuration (if possible)

Visual control

Exchange of defective parts

Troubleshooting: sequence, network, application

GOOD

Drive test

BAD

Control card exchange

GOOD

Drive test

BAD

Power exchange

Drive test

BAD

Drive test

GOOD

Power exchange

Drive test

GOOD

Control card exchange

Drive test

BAD

Control card and power card exchange

Drive test

GOOD

Drive calibration

- Check the drive network engineering
- Resume the test

Factory configuration or customer's if backup performed, then back to the original customer
Powers from 7.5 kW to 15 kW

Altivar 18 input - Backup of the customer's configuration (if possible)

Troubleshooting:
- sequence, network, application

Visual control

Drive test

Control card exchange

GOOD

BAD

Drive test

Power exchange

Exchange by the old control card

GOOD

BAD

GOOD

BAD

Control card exchange

Drive test

Drive test

Drive test

Control card exchange

Drive test

Exchange of control card and power elements

Exchange of the 1st power element

Exchange of the 2nd power element

Drive test

Drive test

Drive test

Drive test

GOOD

BAD

BAD

GOOD

BAD

Drive test

- Check the drive network engineering
- Resume the test

Factory configuration or customer's if backup performed, then back to the original customer
8.5 Powers from 0.37 to 7.5 kW – 230 V or 400 V

8.5.1 Rectifier bridge

The measurements have to be carried out between the input power terminals L1, L2 (single-phase) and L3 (tri-phase) and the −, + of the DC bus. The + terminal of the DC bus can always be reached on the power terminal block at PA. According to the size, the - terminal of the DC bus can be reached on the power cards and screen printed as follows:
- ATV18U09M2/18M2: welding at the left of the mark T (transmitter of the braking transistor GTR7)
- ATV18U29M2: mark - (transmitter of the braking transistor GTR7)
- ATV18U41M2/U54M2/U72M2/U90M2/D12M2: mark N

Use: Digital or rotating-loop multimeter with diode test function or diode tester. Adjust the position on diode test.

8.5.2 DC Bus

Control with an ohmmeter that there is no straight short circuit between the −, + terminals of the DC bus (see chapter 2.6.1.1).

The ohmic value is likely to change (load of condensers).

*Note: If a smoothing condenser is defective the power card has to be changed.*

8.5.3 Power module

![Diagram of power module measurements]

- L1 L2 L3
  - 0.4 to 0.7 V
- L1 L2 L3
  - ∞
8.6 Powers 11 & 15 kW - 400 V

8.6.1 Rectifier bridge
The measurements have to be carried out between the input power terminals L1, L2 and L3 and the -, + of the DC bus. The + terminal of the DC bus can always be reached on the power terminal block at PA. The - terminal of the DC bus can be reached on the non-marked terminal (x) at the right of PB.

Use: Digital or rotating-loop multimeter with diode test function or diode tester.

8.6.2 DC Bus
Control with an ohmmeter that there is no straight short circuit between the -, + terminals of the DC bus (see chapter 2.6.2.1).
The ohmic value is likely to change (load of condensers).

Note: If a smoothing condenser is defective the power card has to be changed.

8.6.3 Power module
The measurements have to be carried out between the motor power supply terminals U, V and W, and the -, + of the DC bus (see chapter 2.6.2.1).
9. Assistance to repair

9.1 Control of the various parameters or functions - Calibration

Drive calibration
- Use a motor of a power similar or superior to the drive power (1 calibre maximum).
- Connect the PC link additional part VW3A18104 to the drive.
- Switch on the PC and run the SCALE18.EXE software from the CD-ROM
- Follow the instructions given on the screen and carry out the drive calibration.

Drive calibration with current
- Connect the drive directly to the network without the alternostat.
- Connect the motor and connect a RMS ammeter on a motor phase.
- Follow the instructions given on the screen and carry out the drive calibration.

Drive calibration with voltage
- Supply the drive through the alternostat.
- Connect a voltmeter between L1 and L2.
- The drive is stopped, the motor should not run.
- Follow the instructions given on the screen and carry out the drive calibration.

9.2 Dismantling / Reassembly manuals for sub-assemblies and components

9.2.1 Power access (power off)
To control the power elements, the drive has to be opened to reach test points located on the power card for sizes from 1 to 4. For size 5, the power can be controlled directly on the terminals.
- Put on the anti-static strap.
- Remove the metallic “cable gland” door.
- Remove the drive housing (control card support).
- Disconnect the sheeting and the power card connector (if necessary).

9.2.2 Checking of the control card

9.2.2.1 Dismantling of the control card
- Put on the anti-static strap.
- Remove the drive housing.
- Disconnect the sheeting and the power card connector.
- Remove the control card.

9.2.2.2 Reassembly of the control card
- Adjust and screw the control card into the housing.
- Reconnect the sheeting and the power card connector.
10. Quality system

It is imperative that the repaired drive has to be sent back to the original customer. The country is responsible for the updating to the last index (excluding warning of the VVD activity) and the drive mechanical overhauling (scratches, etc.). If at all possible, the customer's adjustments will be saved. However, Schneider Electric SA cannot be liable for the adjustments carried out (security).

10.1 Repair validation procedure

Drive test

- Use a motor of the same power as the drive power (if possible) (take care of the coupling according to the voltage M2 or N4).
- Have the speed of the motor varied by the order on all the speed range.
- Change the rotation direction with the LI1 direct direction and LI2 opposite direction running orders for example.
- Check the correct operation of the releasable fan according to the running status.
- Test the logic inputs LI2, LI3, LI4.
- Check the correct operation of the keyboard (Example: modify ACC parameter).
- Test the defective function described by the customer.

If the drive test is good, calibrate the drive.

10.2 Repair briefing

Supports common to all VVD products have to be used. This briefing has to be transmitted to the customer and to DAS and must contain the following information:

- Malfunction observed by the customer.
- Product information (complete reference, version, manufacturing date, etc.).
- Malfunction observed by the technician at product reception.
- State of product historical and diagnosis.
- Tests and checks performed and results.
- Possible breakdown causes.
- Faulty and replaced components.
- Returned product configuration.

10.3 Quality reporting to DAS CI

After sending the repair briefing to DAS, RETCLI or COUNT (according to the countries) has to be informed for the DAS to manage the product quality at best.