

USERGUIDE

# Replacing asynchronous speed drivers

**Danfoss VLT 101.5, KEB 54,  
KEB 56, AOIP ACF 215,  
ATV 15 and ATV 16  
with an ATV 58**



**WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!**

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon. Contact Conair at [info@conairgroup.com](mailto:info@conairgroup.com) or 1-800-654-6661 for more current information, warnings, and materials about more recent product manuals containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

## – SELECTING THE SHEETS –

Select the correct sheet depending on the cabinet and the speed driver to be replaced :

Speed driver / cabinet	KIT	PX 85	PY–PZ 85	PZ 86–87–88	P900 P900+	CN900++	MPA XE	MPA XN	MPA–II XN–YN
<b>DANFOSS</b>	40E7070x or 40E7090x	Add an interface board 20E65501 and consult sheet 2 (page 6)	Sheet 1 (page 4)	Sheet 2 (page 6)					
<b>KEB 54</b> <b>AOIP ACF215</b>	40E7090x	X	Sheet 3 (page 8)	Sheet 4 (page 10)					
<b>KEB 56</b>	40E7090x	X	X	Sheet 5 (page 12)					
<b>ATV 15</b>	40E7080x	X	X	Sheet 6 (page 14)	Sheet 7 (page 16)		Sheet 8 (page 17)	Sheet 9 (page 18)	
<b>ATV 16</b>	40E6680x	X	X	X	Sheet 7 (page 16)	Sheet 11 (page 20)	Sheet 8 (page 17)	Sheet 9 (page 18)	Sheet 10 (page 19)

X : If the speed drivers are replacements of the original speed driver. Consult the chapter for the original speed driver.

If you are replacing an ATV 16, before replacing the speed driver, note the value of parameters : Acc, dEc, HSP, UFr, ItH, FrS and tFr. The values will be used as a basis for setting the ATV 58. If it is not possible to read the parameters, consult the tables on page 22.

**In all cases, the motor must have a triangle connection.**

Kits' contents :

– DANFOSS 380 or 415 Volts three–phased → ATV 58 : Ref. **40 E 707 0x**

As well as the speed driver and an adaptor panel, this Kit contains fuses, fuse holders, a piece of DIN rail, a single–phased transformer 230/400 +/- 15 V → 230 V and a double pole double throw relay that is not always useful.

– KEB 54, KEB 56 or DANFOSS 220 V single–phased → ATV 58 : Ref. **40 E 709 0x**

As well as the speed driver and an adaptor panel, this Kit contains a double pole double throw relay that is not always useful.

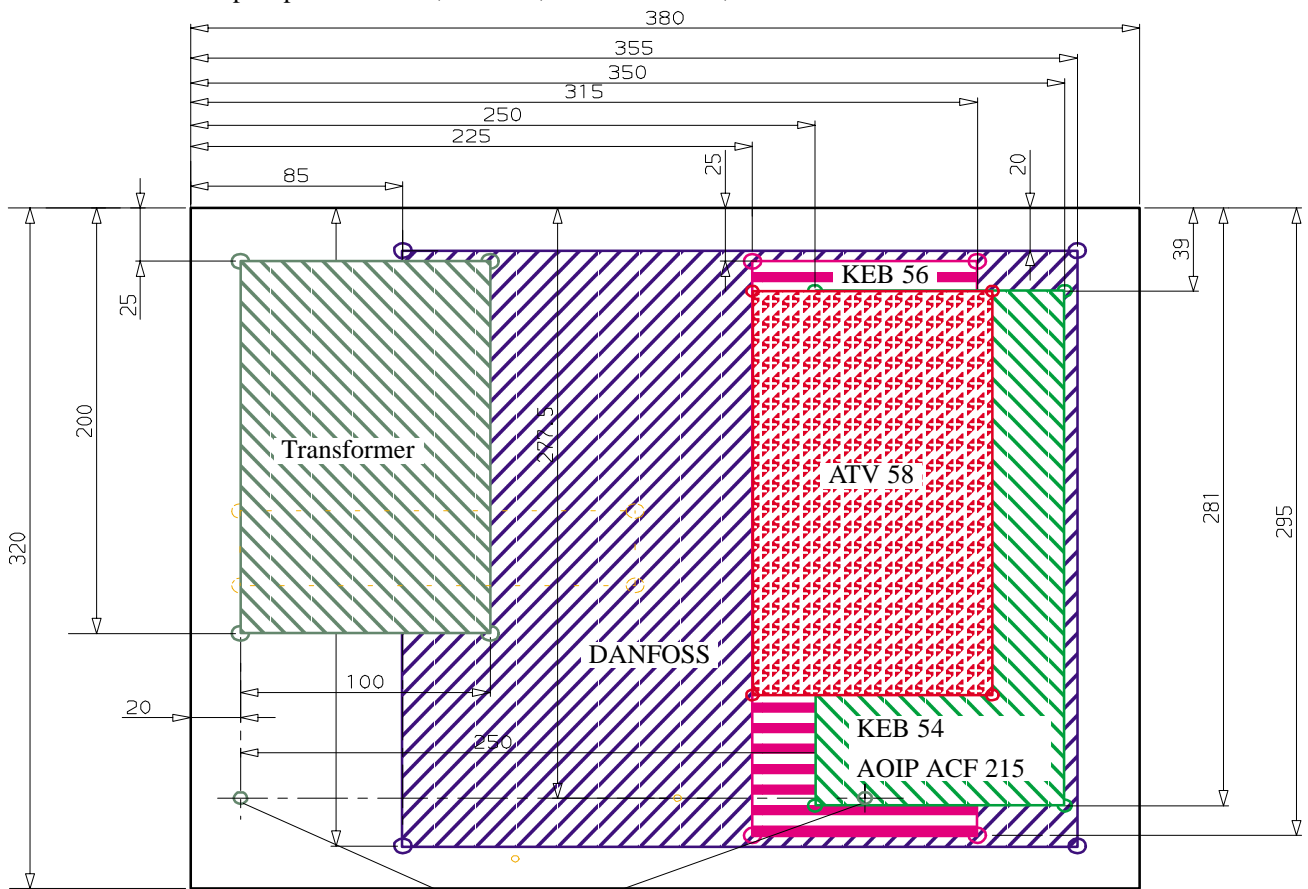
– ATV 15 → ATV 58 : Ref. **40 E 708 0x**

As well as the speed driver and an adaptor panel, this Kit contains a double pole double throw relay that is not always useful. The panel is installed in the place of the ATV 15 so that the ATV58 can be installed without any extra boring.

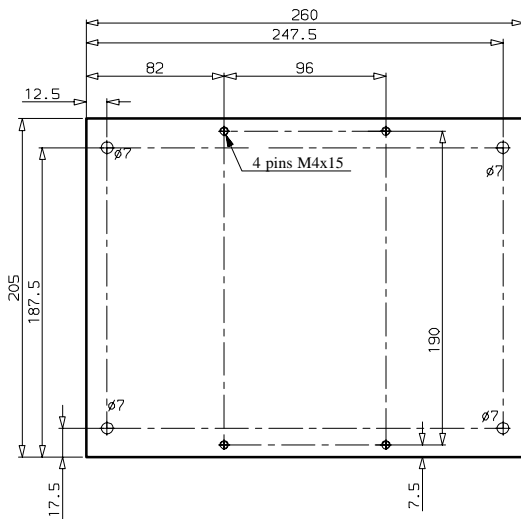
– ATV 16 → ATV 58 : Ref. **40 E 668 0x**

As well as the speed driver and an adaptor panel, this Kit contains a double pole double throw relay that is not always useful. The panel is installed in the place of the ATV 16 so that the ATV58 can be installed without any extra boring.

Mechanical adaptor panel KEB 54, KEB 56, AOIP ACF 215, DANFOSS VLT 101.5 => ATV 58

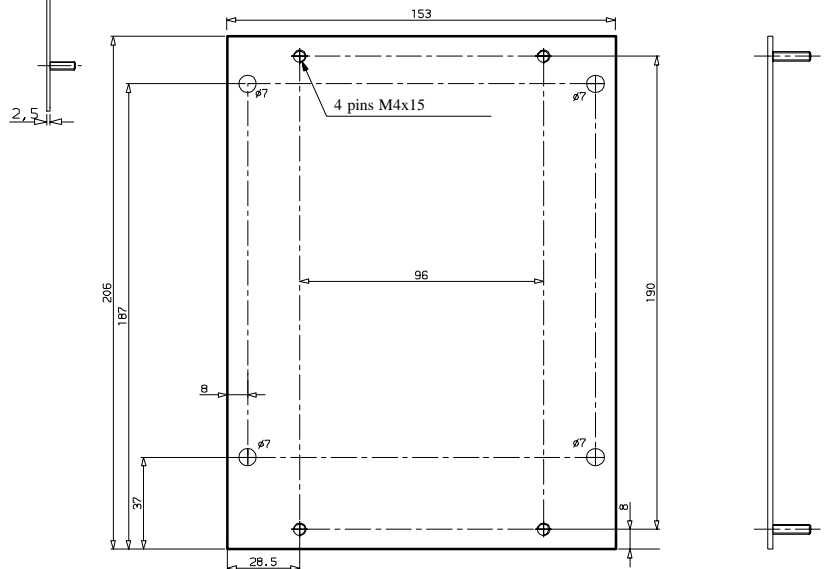


DIN rail fixing if supplied with the Kit

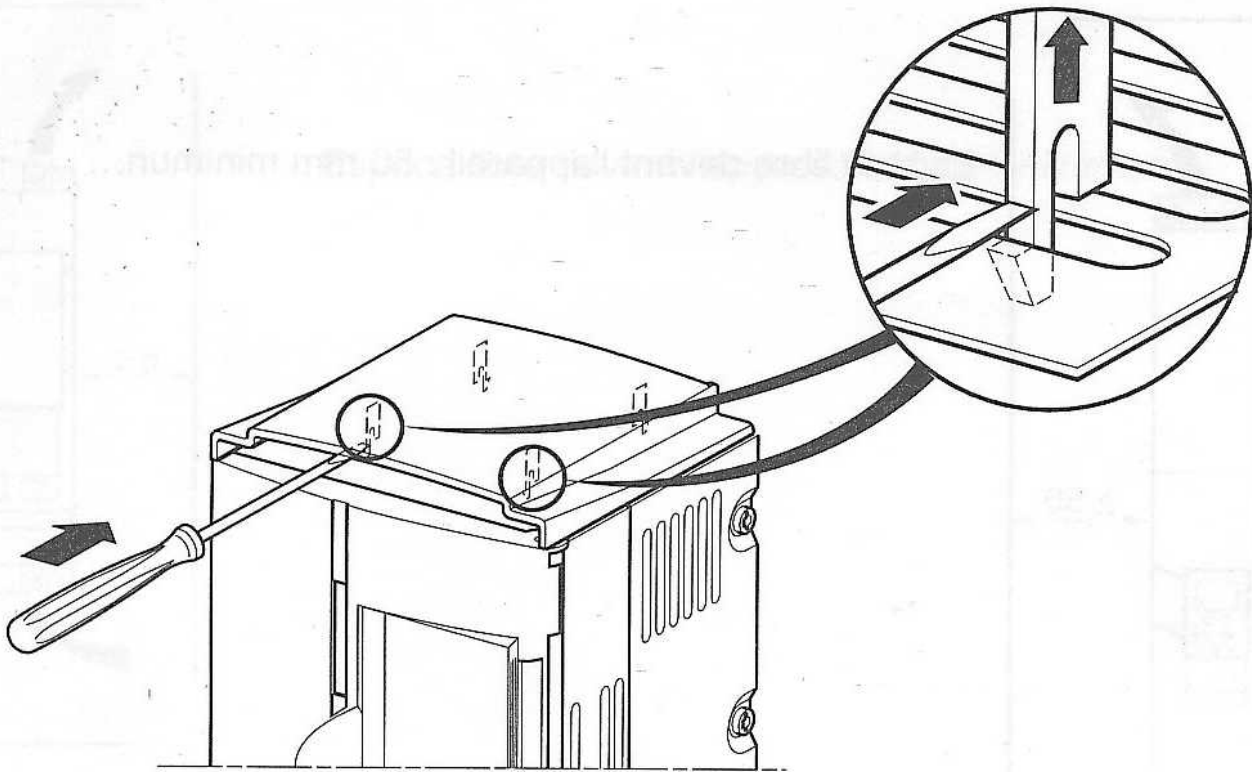


mechanical adaptor panel ATV 15 => ATV 58

mechanical adaptor panel ATV 16 => ATV 58

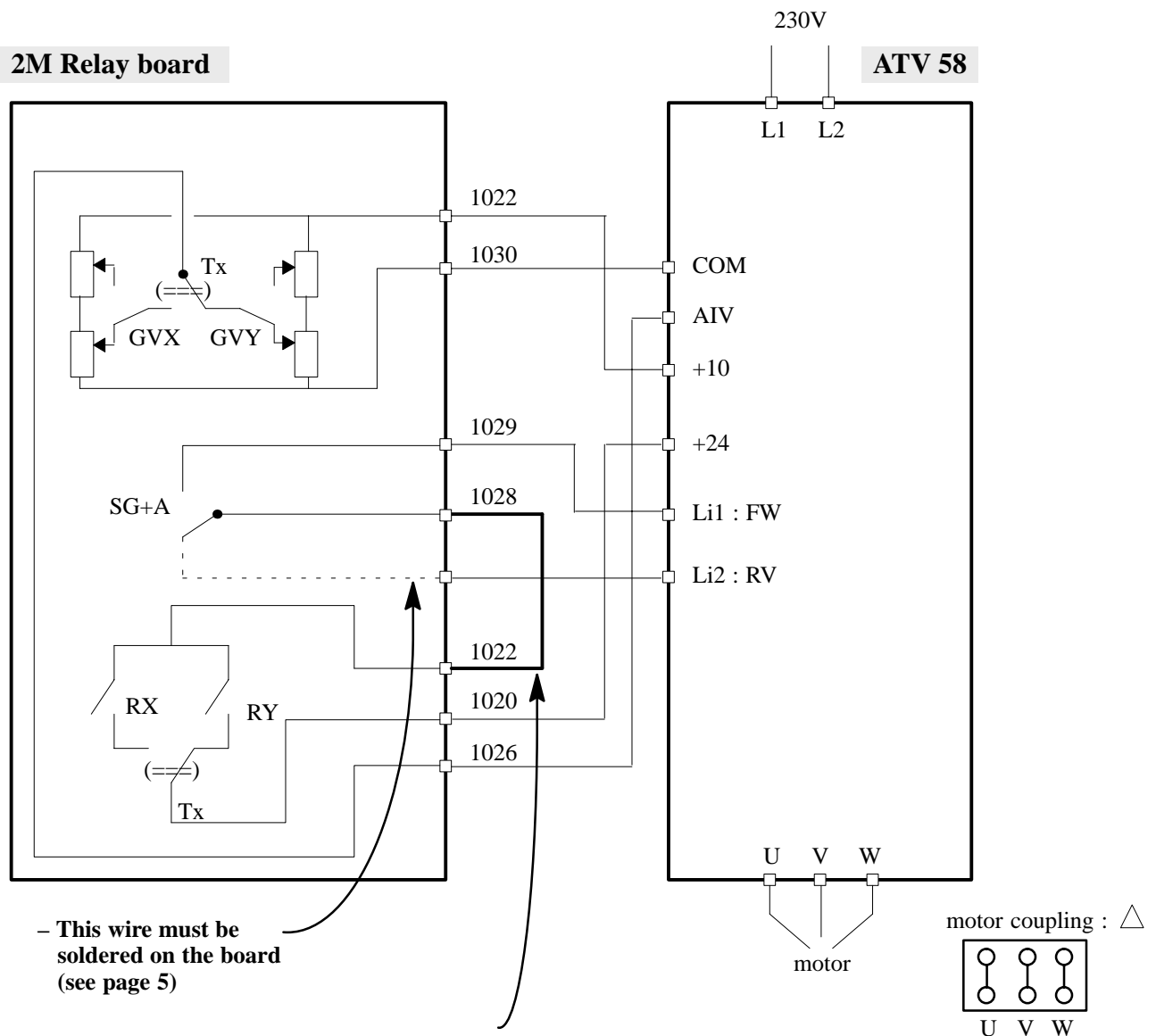


**In all cases, remove the protection cover to help the speed driver cool down.**

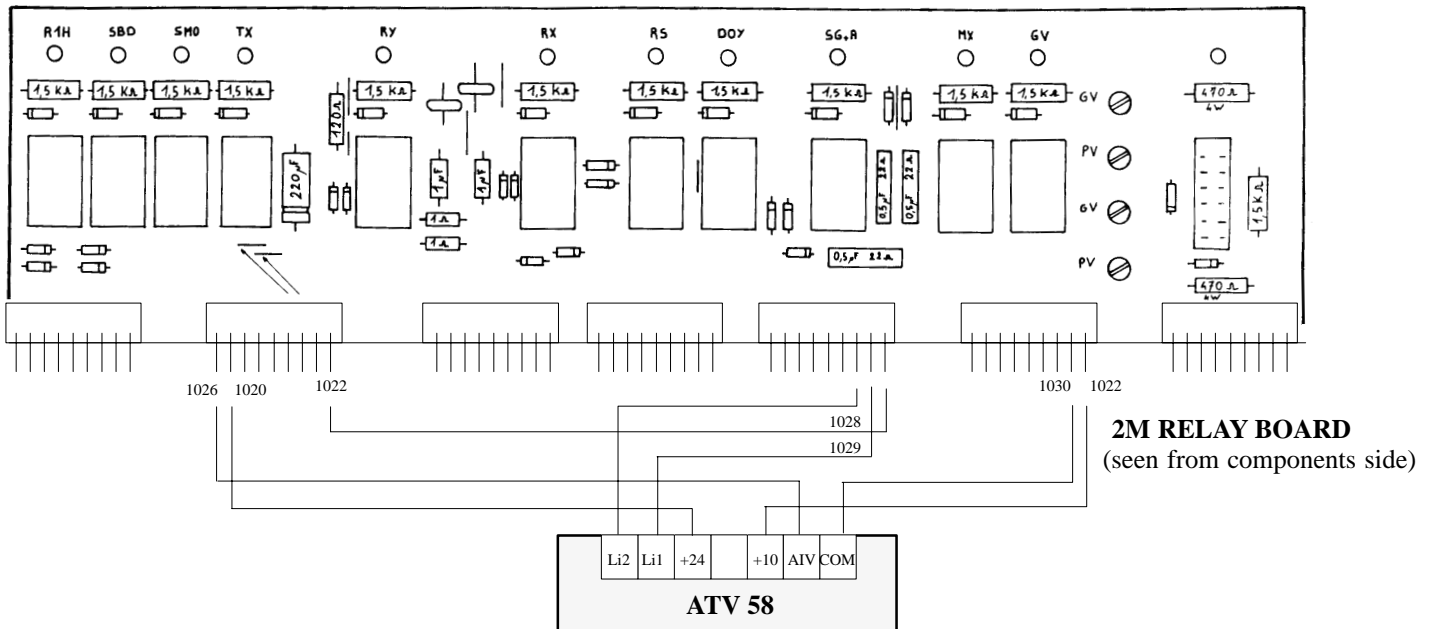


Cabinet : **PY-PZ 85**  
 Connection of : **ATV 58**  
 In the place of : **DANFOSS**  
 On : **2M Relay board 20E00216**

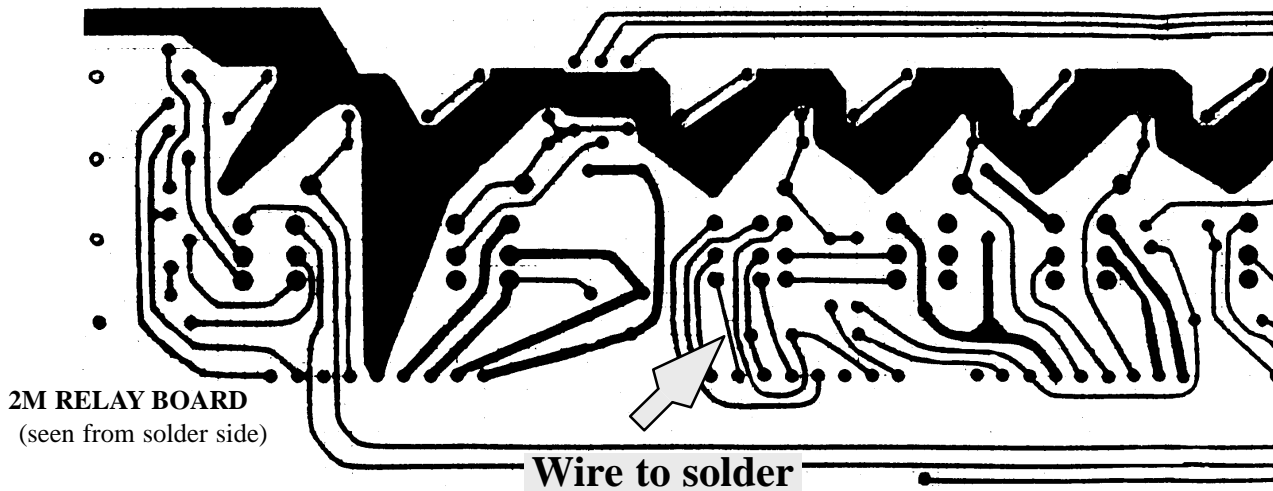
## 1 1. Electric drawing



## 1 2. Connection drawing



## 1 3. Modification of the 2M relay board



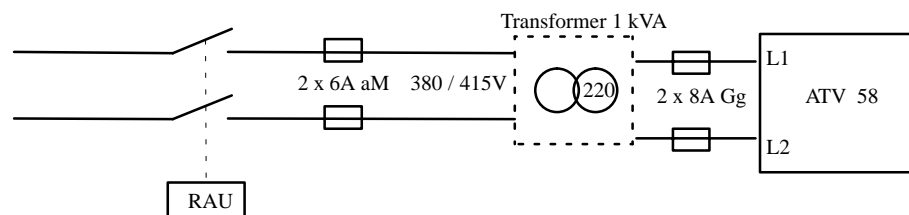
## 1 4. Speed driver power supply

To replace the speed drivers powered with 220V, connect the power cables directly to L1 L2 as shown in the electric drawing.

To replace the DANFOSS speed drivers powered with three-phased 380V or three-phased 415V, you must install a transformer.

This transformer as well as the fuses and the fuse holders are supplied in the Kit : 40 E 707 0x

The transformer is fixed on the left of the adaptor panel supplied in the kit. The connection is as follows:

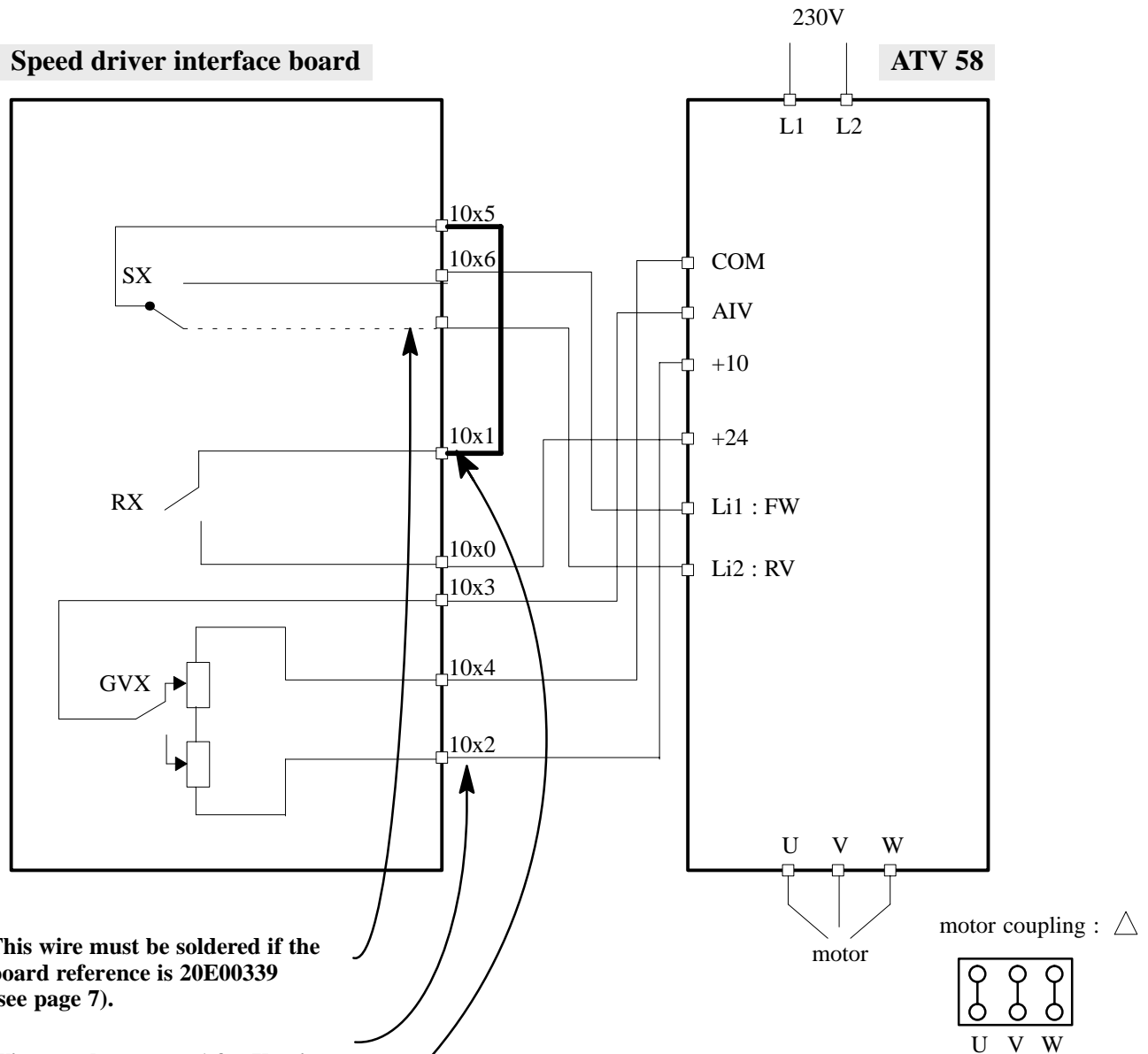


## 1 5. Transformer coupling

The transformer has a single-phased power supply. It has +/- 15 Volt terminals so that it can be adapted to power voltages of 215 -> 245 V and 385 -> 415 Volts.

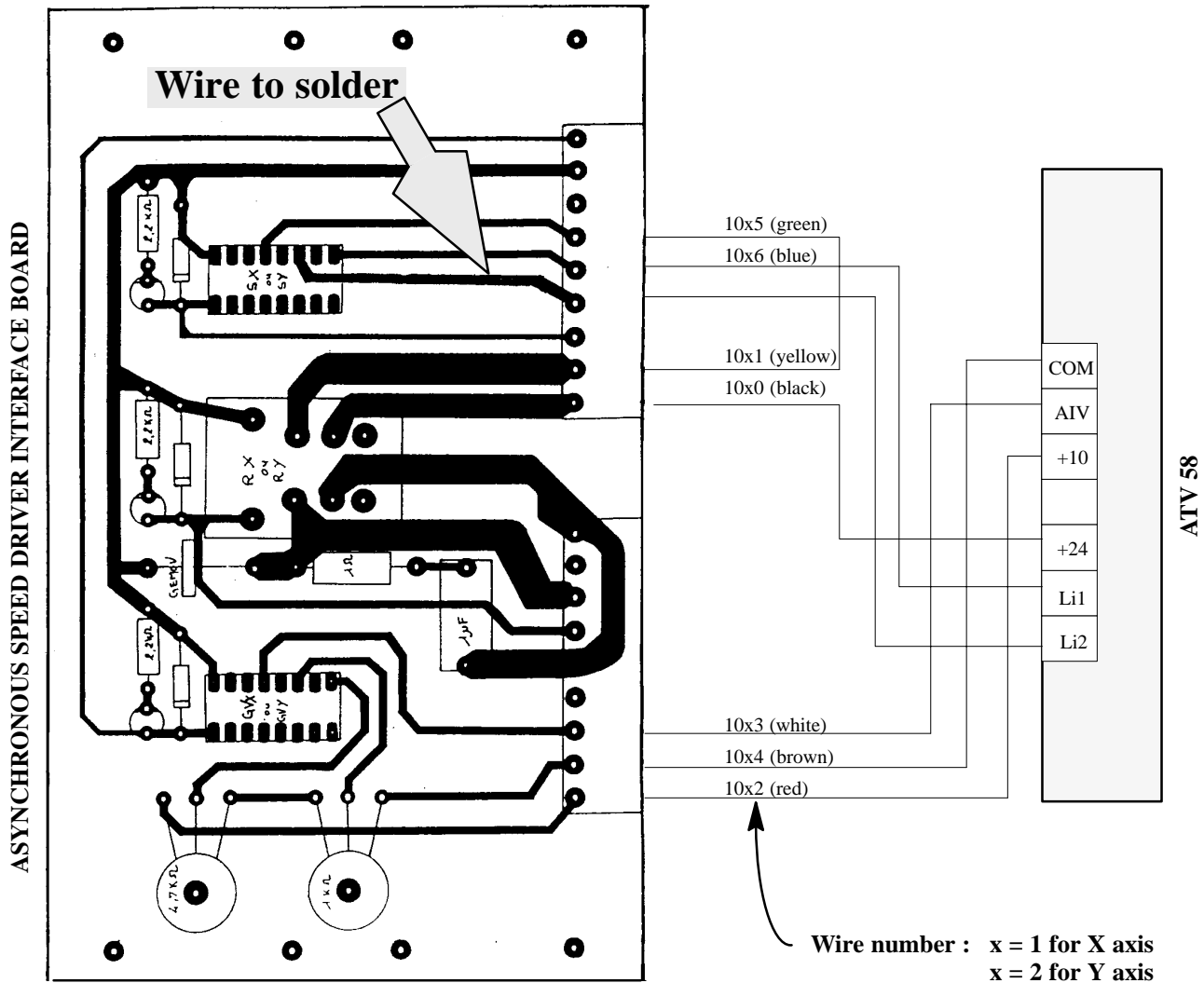
Cabinet : PY-PZ 86 / 87  
 Connection of : ATV 58  
 In the place of : DANFOSS  
 On : Speed driver interface board  
 20E33901 or 20E00339

## 2 1. Electric drawing



- This wire must be soldered if the board reference is 20E00339 (see page 7).
- Wire number : x = 1 for X axis  
x = 2 for Y axis
- Wires 1011 (1021) and 1015 (1025) must be connected together.

## 2 2. Connection and modification of board 20E00339



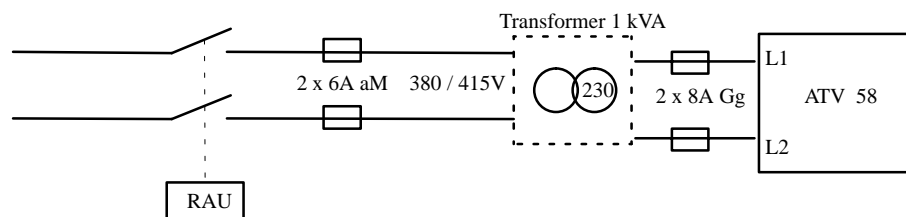
## 2 3. Speed driver power supply

To replace the speed drivers powered with 230V, connect the power cables directly to L1 L2 as shown in the electric drawing.

To replace the DANFOSS speed drivers powered with three-phased 380V or three-phased 415V , you must install a transformer.

This transformer as well as the fuses and the fuse holders are supplied in the Kit : 40 E 707 0x

The transformer is fixed on the left of the adaptor panel supplied in the kit. The connection is as follows:

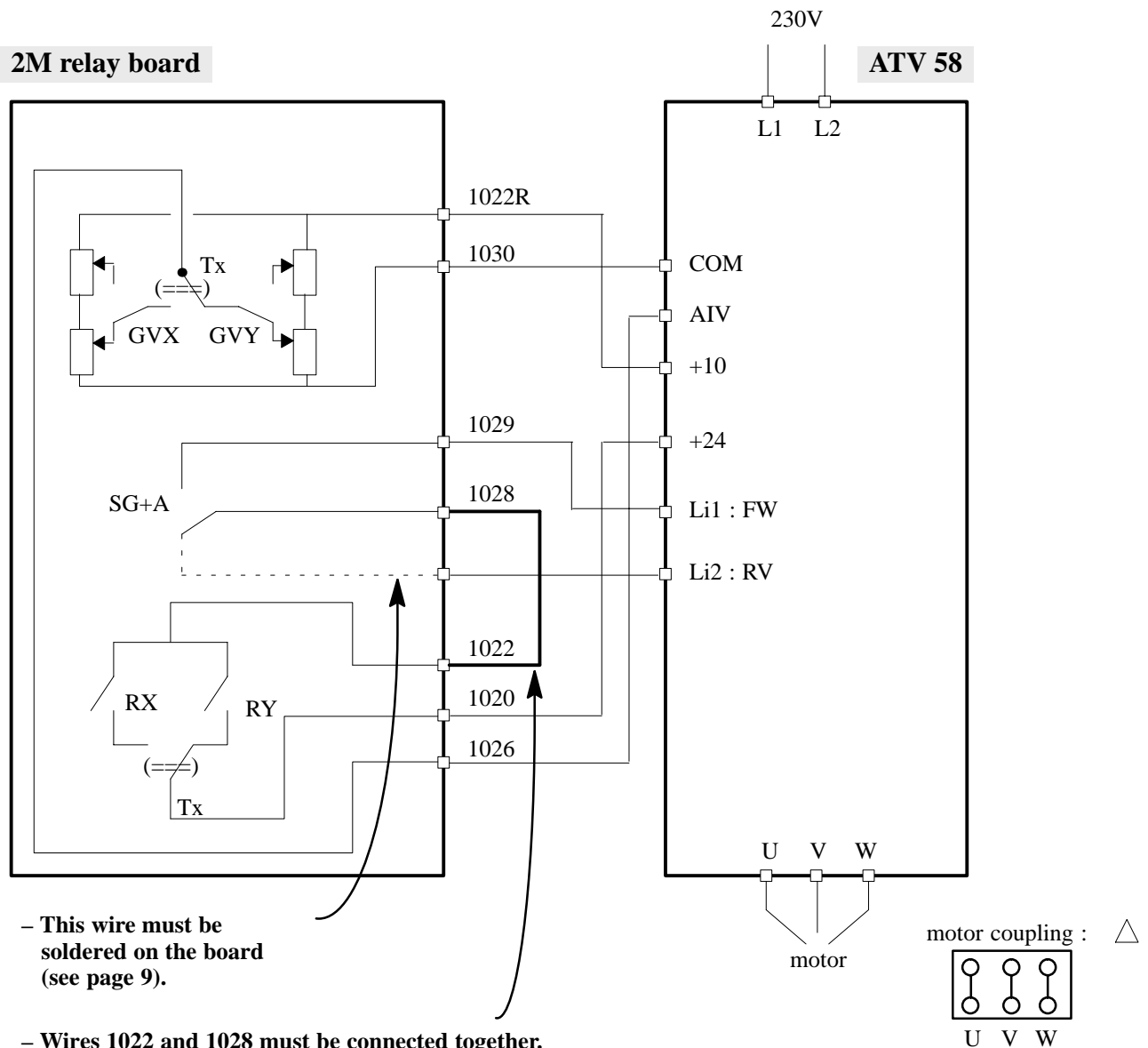


## 2 4. Transformer coupling

The transformer has a single-phased power supply. It has +/- 15 Volt terminals so that it can be adapted to power voltages of 215 -> 245 V and 385 -> 415 Volts.

Cabinet : PZ 85  
 Connection of : ATV 58  
 In the place of : KEB 54  
 On : 2M relay board 20E00216

### 3 1. Electric drawing



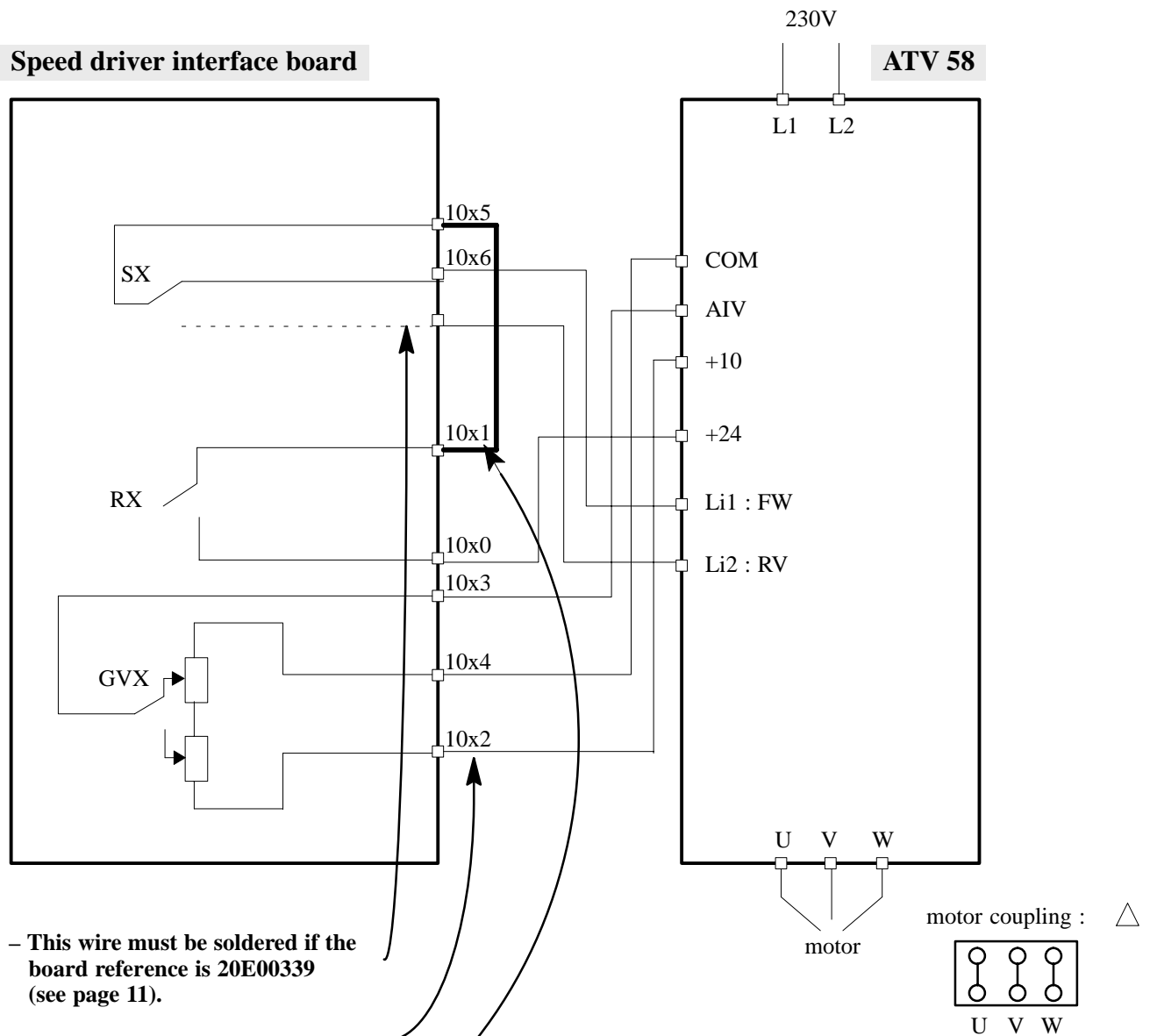
**WARNING :** Note the position of the two 1022 wires before cabling

- . one 1022 wire is connected to the potentiometers and is connected to terminal +10 on ATV 58.
- . one 1022 wire is connected to RX (RY) and is connected to wire 1028 on the relay board.



Cabinet : **PZ 86 / 87 / 88**  
 Connection of : **ATV 58**  
 In the place of : **KEB 54**  
 On : **Speed driver interface board**  
 20E33901 or 20E00339

## 4 1. Electric drawing

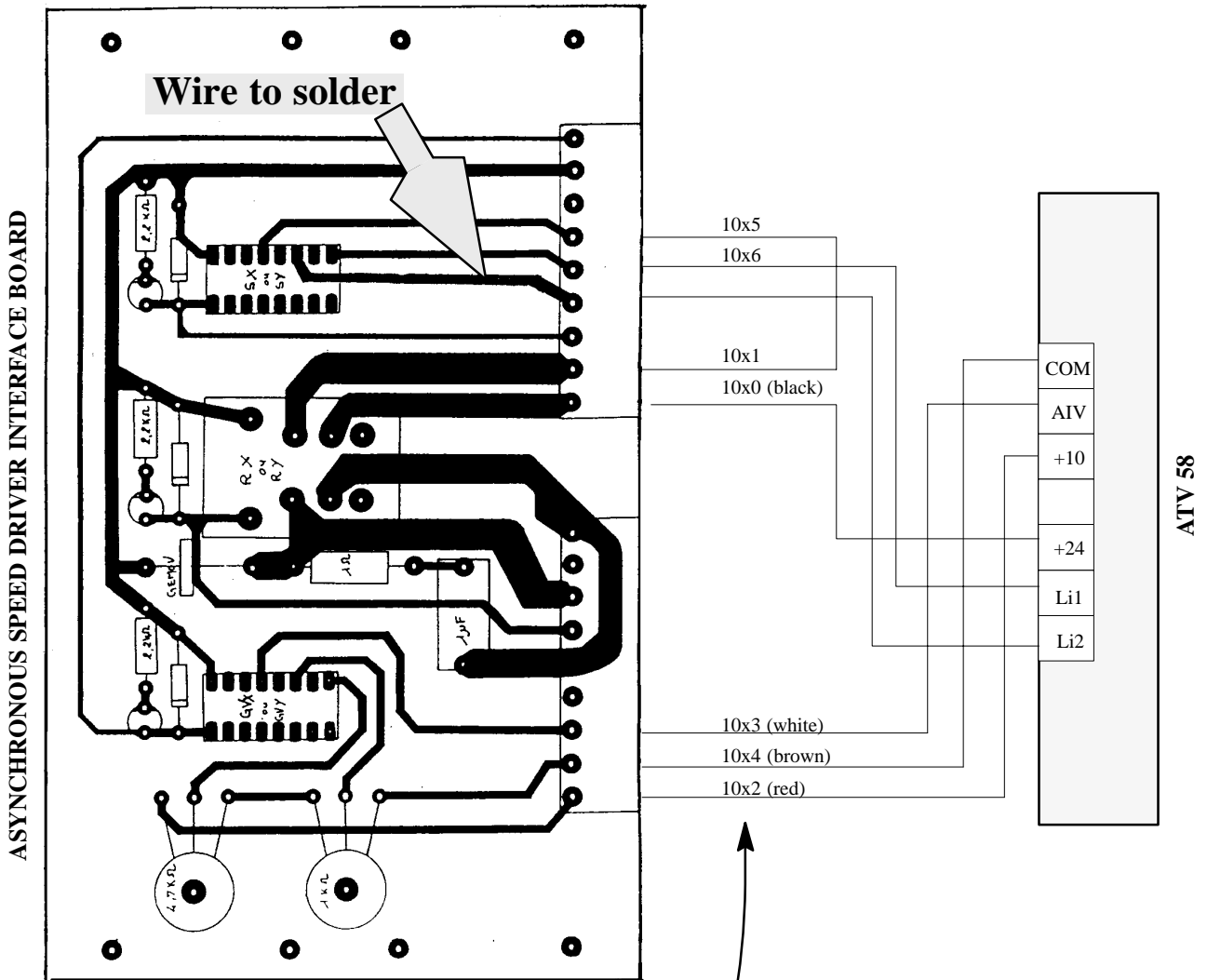


- This wire must be soldered if the board reference is 20E00339 (see page 11).

- Wire number : x = 1 for X axis  
 x = 2 for Y axis

- Wires 1011 (1021) and 1015 (1025) must be connected together.

## 4 2. Connection drawing and modification of the board 20E00339



## 4 3. Speed driver power supply

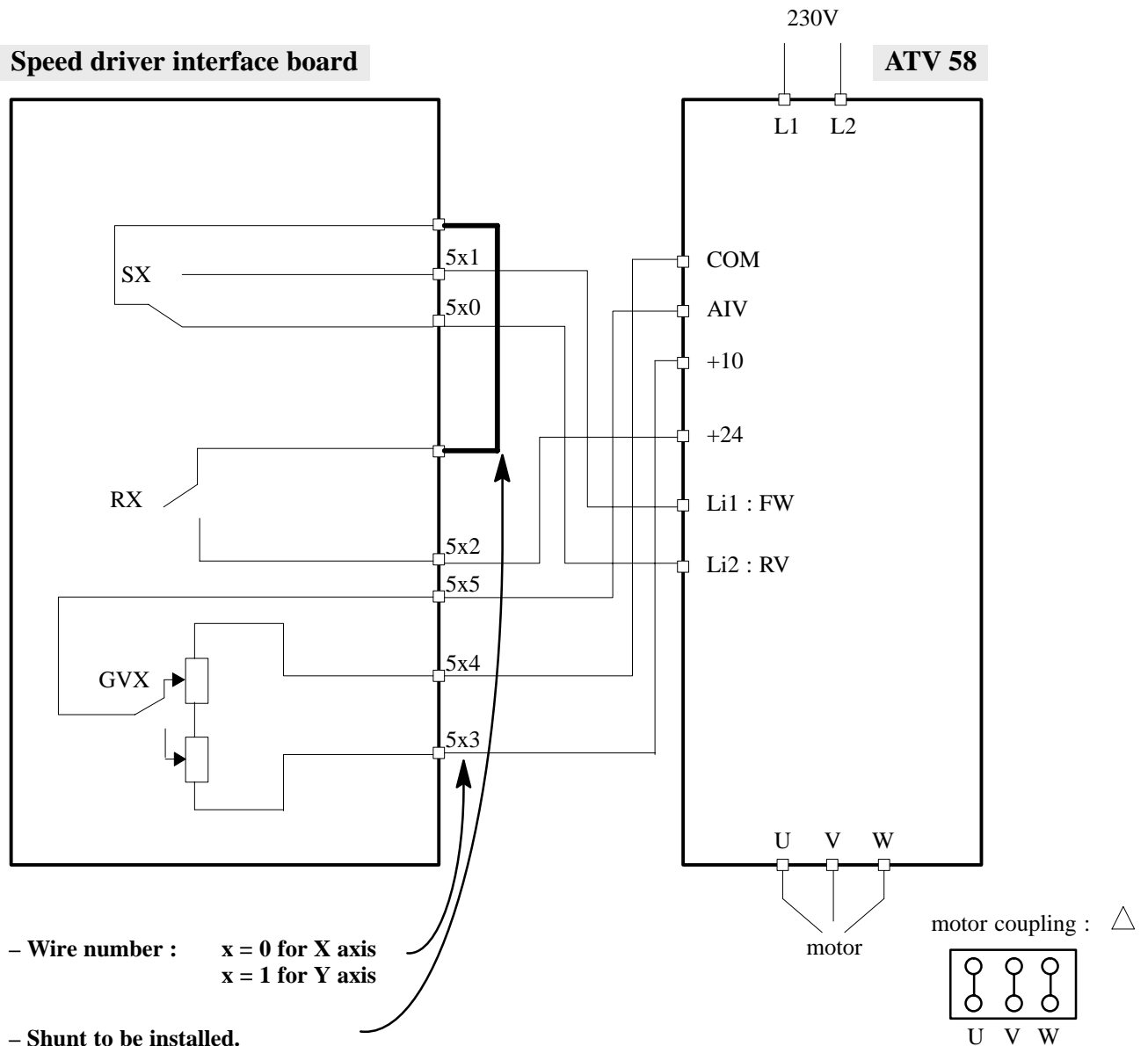
To replace the speed drivers powered with 230V, connect the power cables directly to L1 L2 as shown in the electric drawing.

Cabinet : **PZ 88**  
 Connection of : **ATV 58**  
 In the place of : **KEB 56**  
 On : **Speed driver interface board**  
**20E33901**



If the cabinet is equipped with an 88 asynchronous board ref. 20E00459, the latter must be replaced with a speed driver interface board that is connected as follows :

## 5 1. Electric drawing

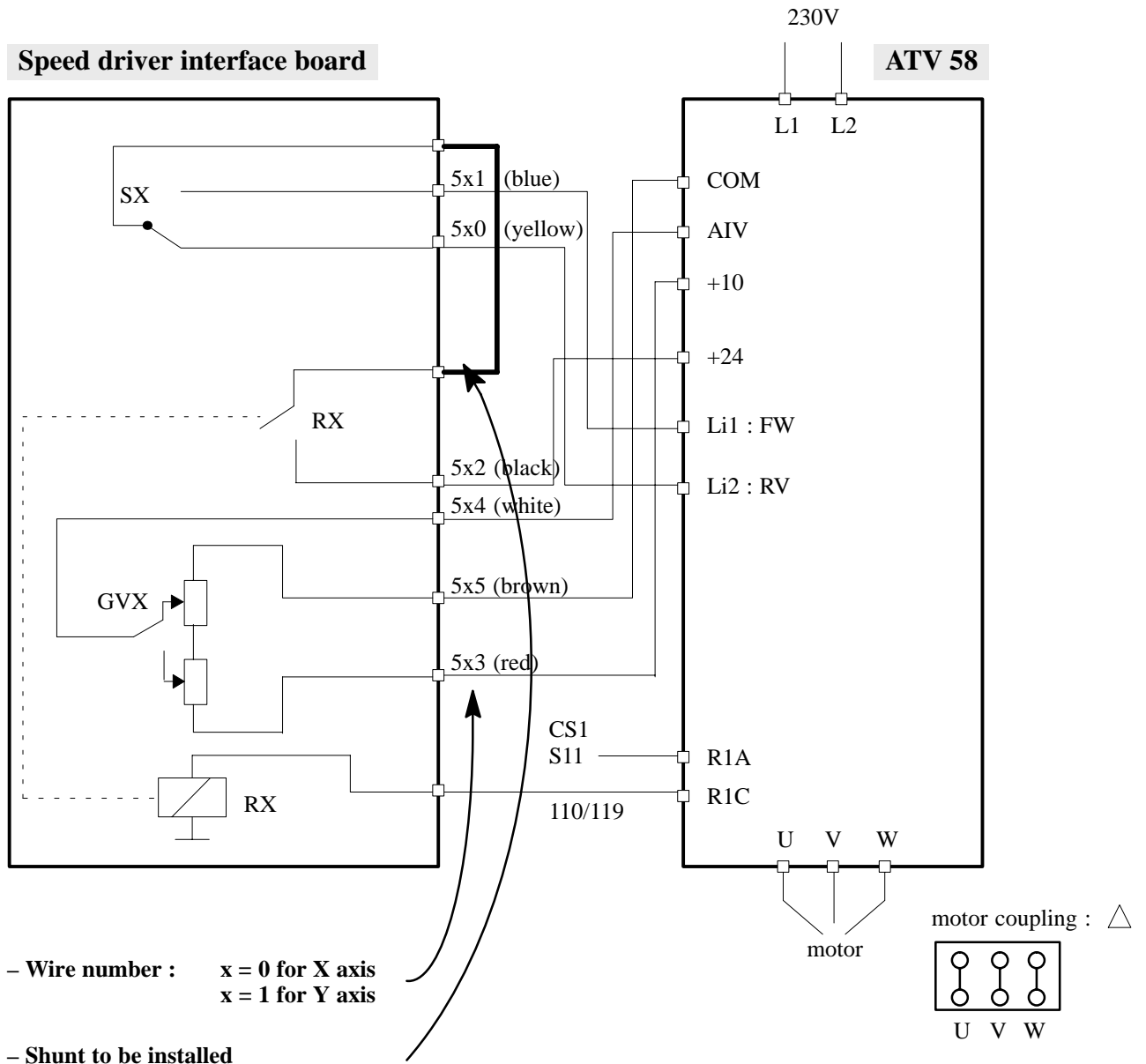


- Connect C12 and C13 from the CS1 output board to 24R for the X axis.  
Connect C15 and C16 from the CS1 output board to 24R for the Y axis.

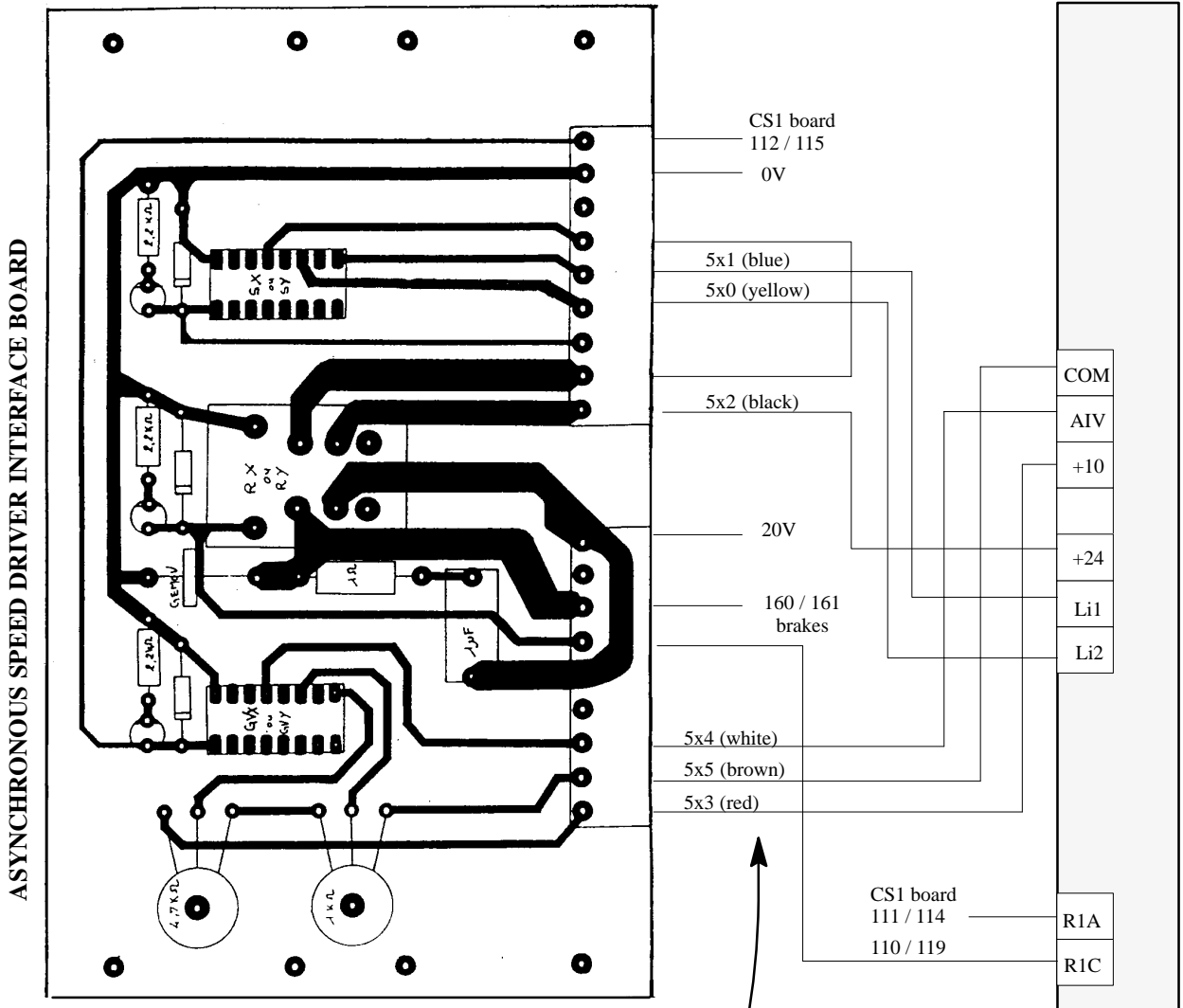


Cabinet : **PZ 87 / 88**  
 Connection of : **ATV 58**  
 In the place of : **ATV 15**  
 On : **Speed driver interface board**  
**20E33901**

### 6 1. Electric drawing



## 6 2. Connection drawing



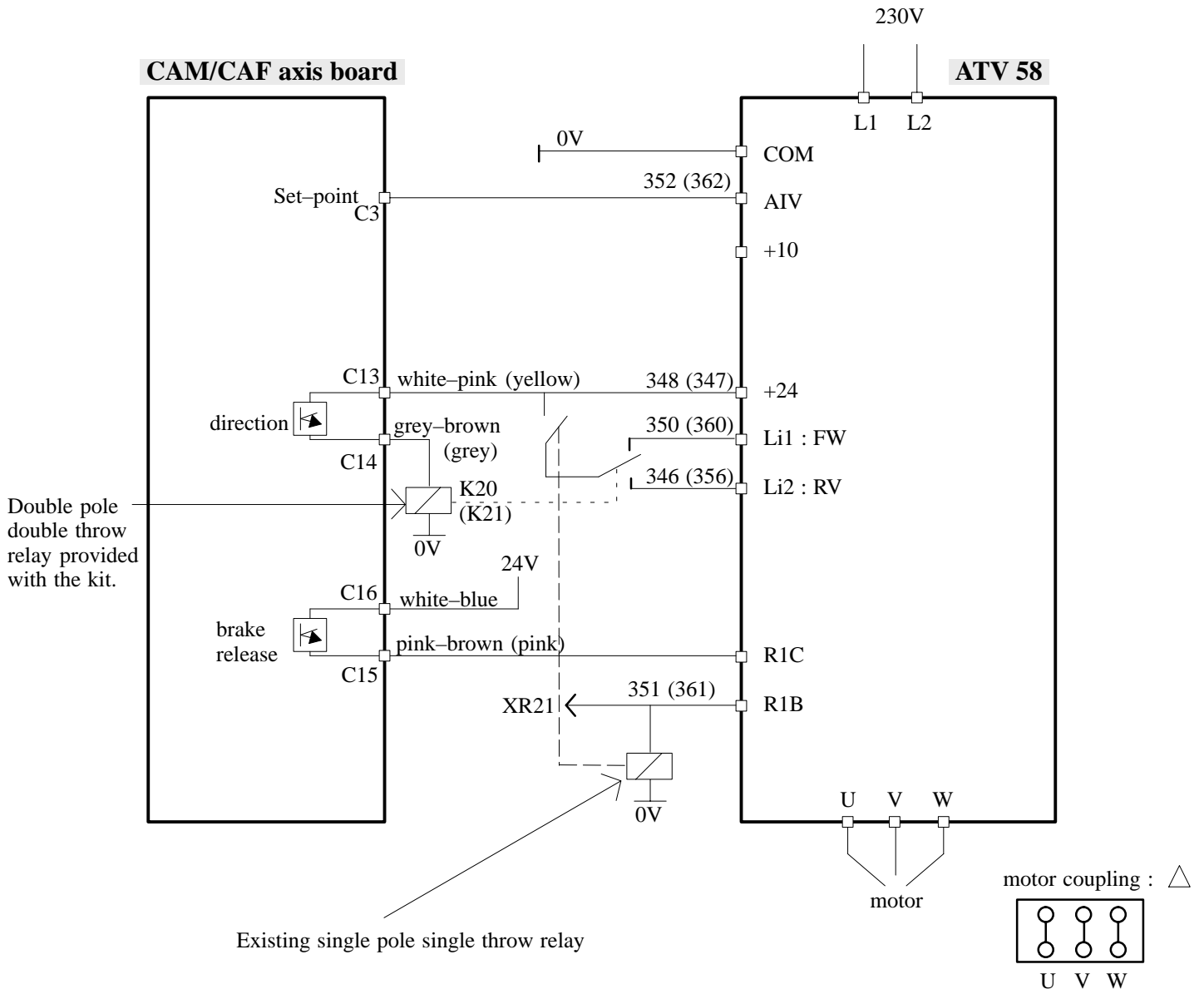
Wire number : x = 0 for X axis  
x = 1 for Y axis

## 6 3. Speed driver power supply

To replace the speed drivers powered with 230V, connect the power cables directly to L1 L2 as shown in the electric drawing.

Cabinet : P 900 or P900+  
 Connection of : ATV 58  
 In the place of : ATV 15 or ATV 16  
 On : CAM / CAF Axis board

## 7 1. Electric drawing

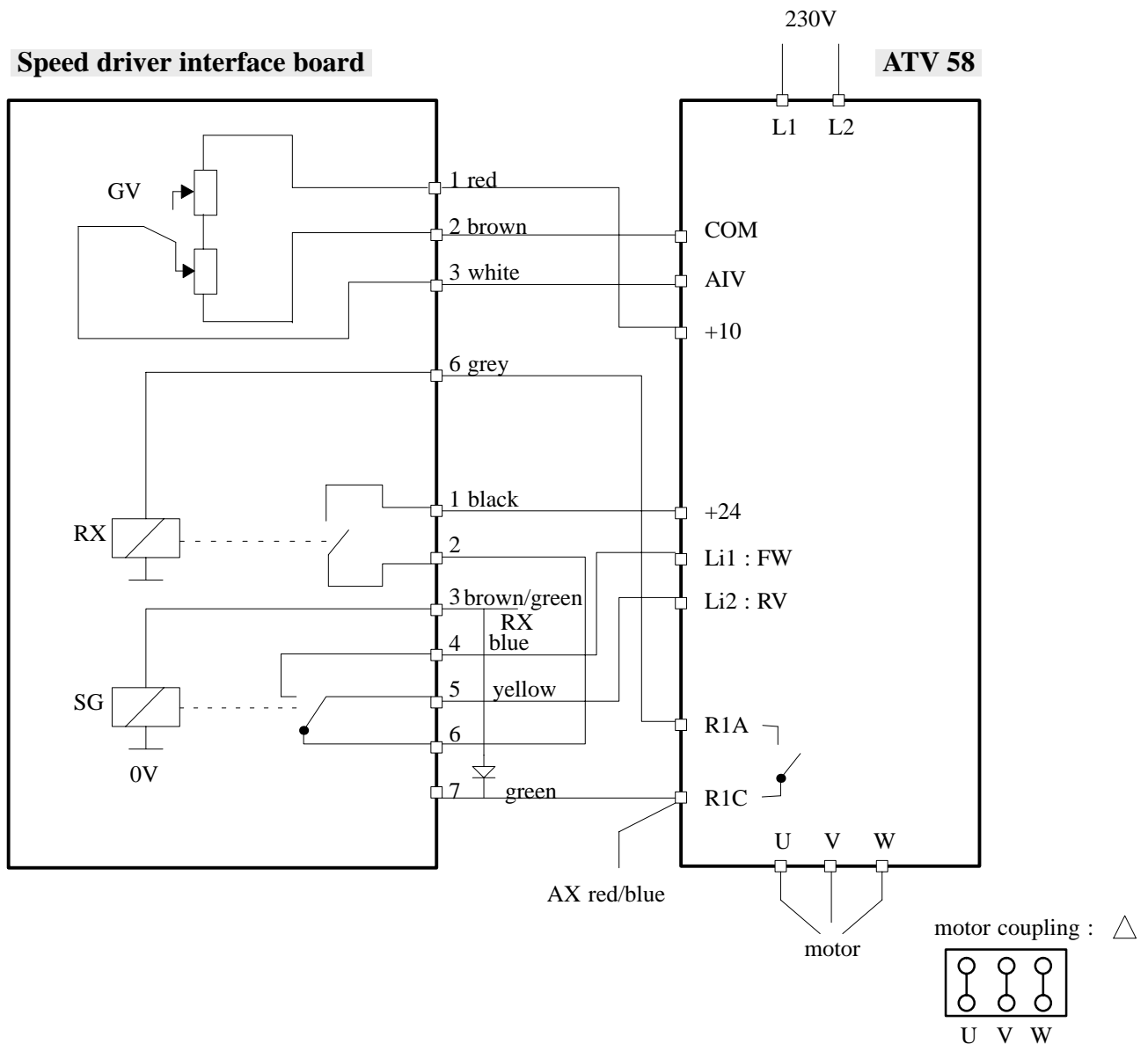


## 7 2. Speed driver power supply

To replace the speed drivers powered with 230V, connect the power cables directly to L1 L2 as shown in the electric drawing.

Cabinet : **MPA XE**  
 Connection of : **ATV 58**  
 In the place of : **ATV 15 or ATV16**  
 On : **Speed driver interface board**  
**20E6550x**

## 8 1. Electric drawing

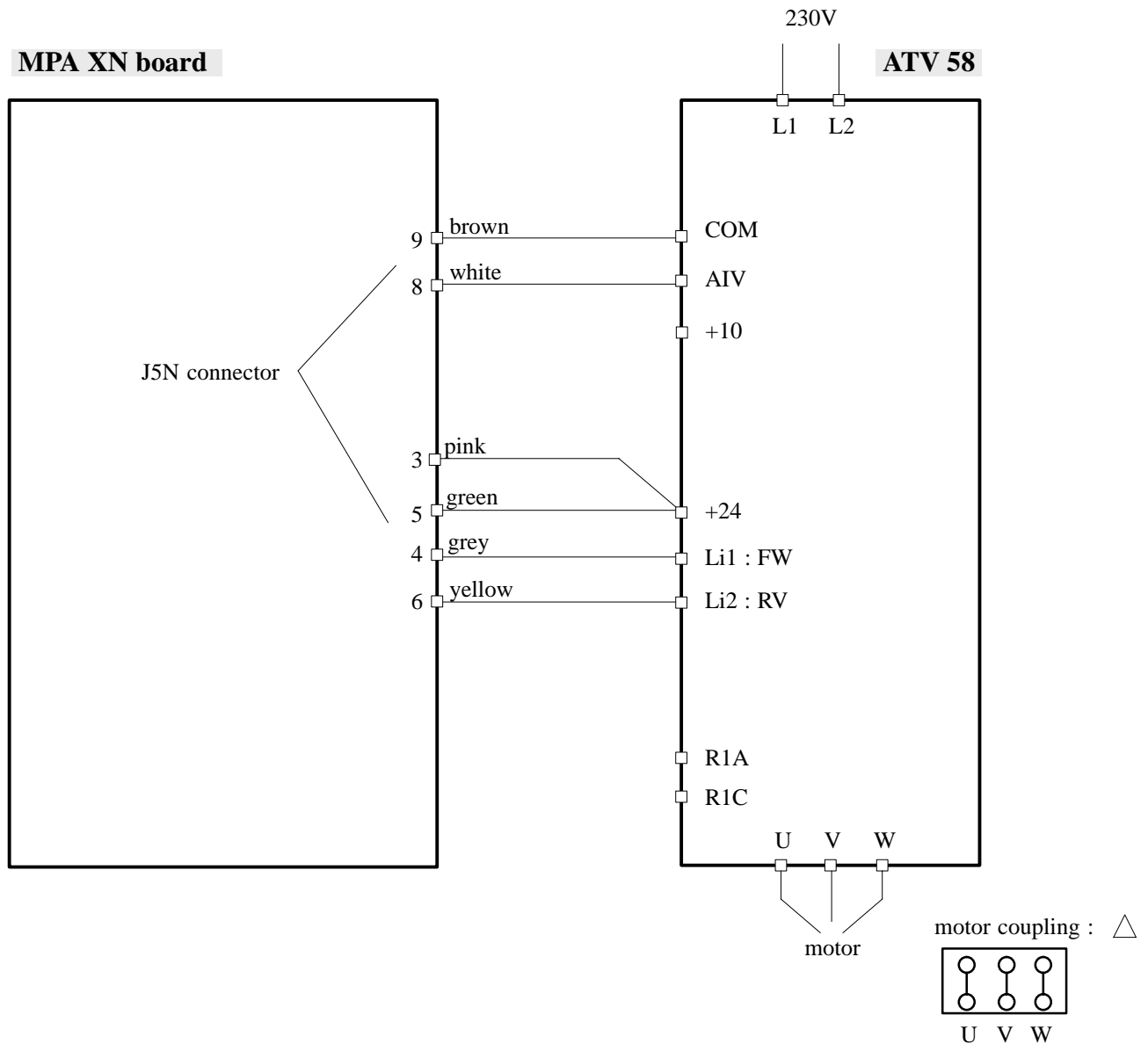


## 8 2. Speed driver power supply

To replace the speed drivers powered with 230V, connect the power cables directly to L1 L2 as shown in the electric drawing.

Cabinet : **MPA XN**  
 Connection of : **ATV 58**  
 In the place of : **ATV 15 or ATV16**  
 On : **XN board 20E6690x**

## 9 1. Electric drawing

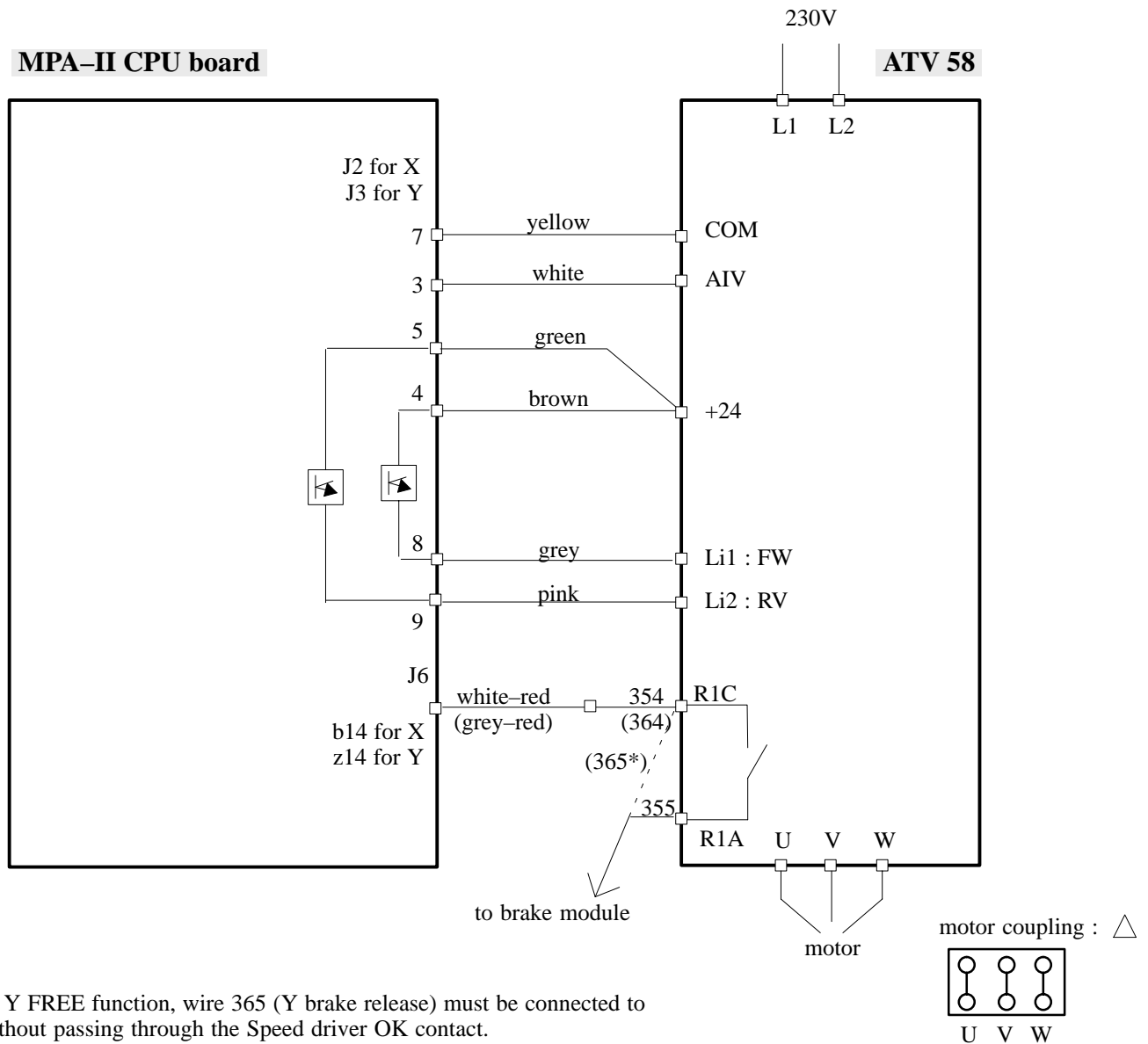


## 9 2. Speed driver power supply

To replace the speed drivers powered with 230V, connect the power cables directly to L1 L2 as shown in the electric drawing.

Cabinet : **MPA-II XN YN**  
 Connection of : **ATV 58**  
 In the place of : **ATV 16**  
 On : **MPA-II CPU board 20E7390x**

### 10 1. Electric drawing



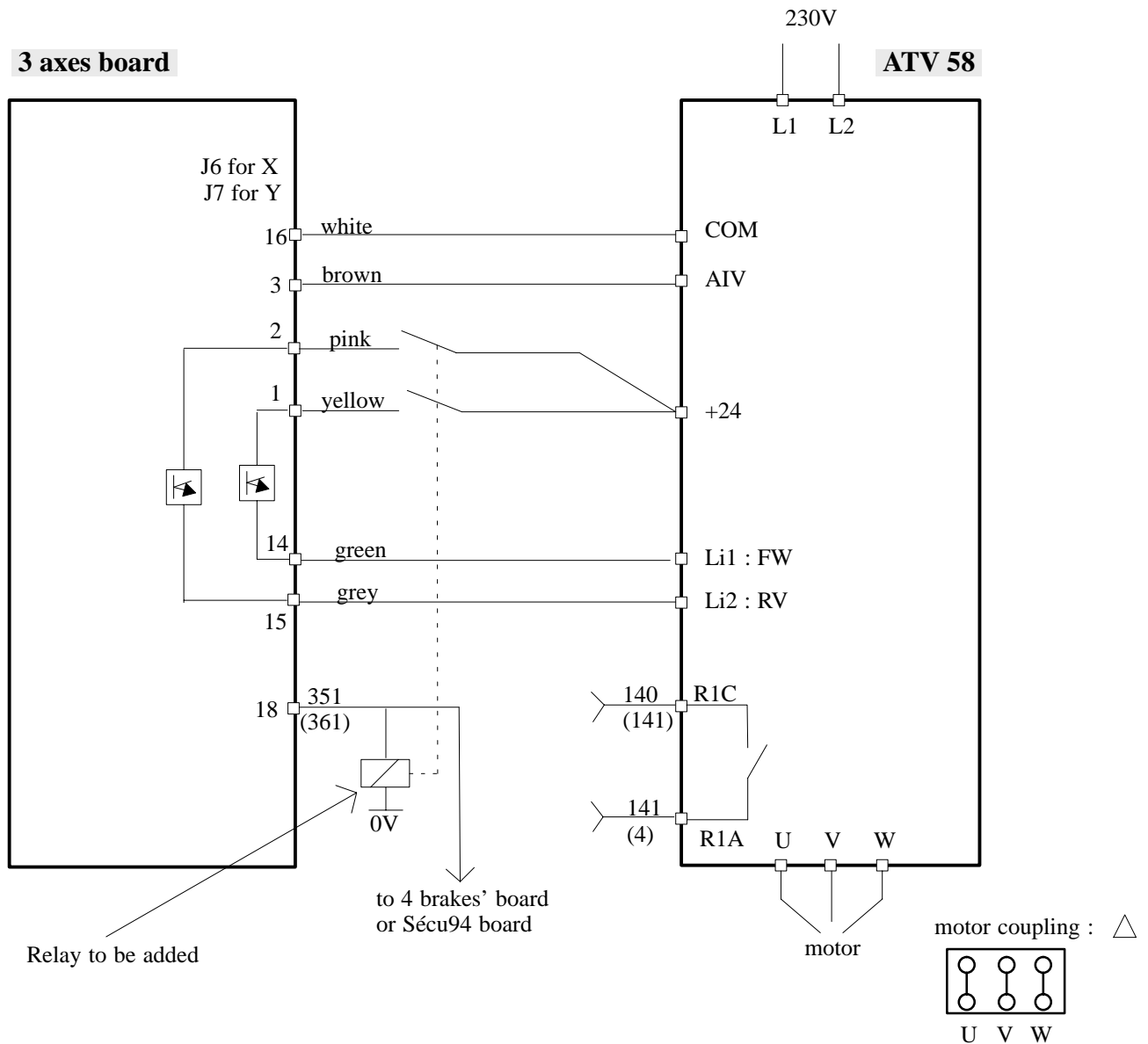
\* To get the Y FREE function, wire 365 (Y brake release) must be connected to R1C, i.e. without passing through the Speed driver OK contact.

### 10 2. Speed driver power supply

To replace the speed drivers powered with 230V, connect the power cables directly to L1 L2 as shown in the electric drawing.

Cabinet : **CN 900++**  
 Connection of : **ATV 58**  
 In the place of : **ATV 16**  
 On : **3 axes board 20E7600x or 20E798xx**

## 11 1. Electric drawing



## 11 2. Speed driver power supply

To replace the speed drivers powered with 230V, connect the power cables directly to L1 L2 as shown in the electric drawing.

## – SPEED DRIVER SETTING –

The speed driver is delivered by Sepro ready set with a set of “standard” parameters (see the list on page 24). However, a certain number of parameters must be adjusted for the axis to function correctly. When replacing an ATV 16, use the values taken from the original speed driver.

Parameters to check or set :

- ACC : Acceleration time (ADJUSTMENT menu) : set to 0.2 sec if the speed driver is driven by a 2-level set-point (low and high speed potentiometers).
- DEC : Deceleration time (ADJUSTMENT menu) : set to 0.4 sec if the speed driver is driven by a 2-level set-point (low and high speed potentiometers).
- Ith : Thermal current (ADJUSTMENT menu) = motor nominal current + 10% . The motor nominal current is taken from the motor’s identification plate.
- FrS : Nominal frequency that can be adjusted from 40 Hz to tFr (DRIVE menu). Value taken from the motor’s identification plate.
- tFr : Speed driver maximum output frequency (DRIVE menu). Must be set to at least 40% above the nominal frequency.
- NCR : Nominal current of motor (DRIVE menu) : taken from the motor’s identification plate.
- NSP : Nominal rotation speed of motor (DRIVE menu) : taken from the motor’s identification plate.
- COS : Power factor (DRIVE menu) : taken from the motor’s identification plate.
- HSP : High speed frequency (ADJUSTMENT menu) : adjustable from LSP to tFr. Set this frequency to 67 Hz or to the value taken from the original ATV 16.
- UFR : IR compensation =Boost (ADJUSTMENT menu) : adjustable from 0 to 150 %. It must be increased whilst checking at all speed levels that the current measured in the motor (LCr in the monitoring menu) is lower than the nominal current taken from the identification plate. If this parameter is too high, you get jerky movements at slow speed.
- SLP : Slip compensation (ADJUSTMENT menu) : cancel if the axis blocks at slow speed.
- BRA : DEC ramp adaptation (DRIVE menu) : remove if the axis blocks at slow speed.
- ENT 3 : Overfluxing rate (ADVANCED DRIVE menu) : cancel if the axis blocks at slow speed.
- tUn : Auto tune (DRIVE menu). This parameter must be set to “yes” for the speed driver to adapt its control to the motor. Once the auto tuning has been done, the “tUn” parameter automatically goes to “done”, or “no” if there is an error.

Consult the “ATV 58 Description and Use” manual to see how to modify these parameters.

ATV 16 parameters for MPA XN or YN robots

	Parameters for the X and Y axes of a PIP ... XN or YN	80	100	150	200	250	300	350	
<b>Acc</b>	Acceleration time	0,1							
<b>dEc</b>	Deceleration time	0,1							
<b>LSP</b>	Low speed	0							
<b>HSP</b>	High speed	48							X : 65 Y : 38
<b>UFr</b>	Voltage / frequency law	50							
<b>FLG</b>	Frequency loop gain	nFL							
<b>ItH</b>	Motor thermal protection	3							
<b>SLP</b>	Slip compensation	OFF							
<b>brA</b>	Deceleration adaptation ramp	OFF							
<b>UFt</b>	Type of voltage / frequency law	L							
<b>tFr</b>	Max. frequency of speed driver	100							
<b>FrS</b>	Nominal frequency of motor	50							
<b>UnS</b>	Nominal voltage of motor	230							

ATV 16 parameters for robots ...

	Parameters for a PIP ...	MPA XE	P900 P900+	S900++									
				100 200 250 300	150		350		400 500		450		
	Axis	X	X & Y	X	Y	X	Y	X	Y	X	Y	X	Y
<b>Acc</b>	Acceleration time	0,2	0.1										
<b>dEc</b>	Deceleration time	0.3 – 0.5	0.1										
<b>LSP</b>	Low speed	0.0											
<b>HSP</b>	High speed	67	67	41	40	39	39	71	40	53	65	67	40
<b>UFr</b>	Voltage / frequency law	50											
<b>FLG</b>	Frequency loop gain	nFL											
<b>ItH</b>	Motor thermal protection	3.0											
<b>SLP</b>	Slip compensation	OFF											
<b>brA</b>	Deceleration adaptation ramp	OFF											
<b>UFt</b>	Type of voltage / frequency law	L											
<b>tFr</b>	Max. frequency of speed driver	67	100										
<b>FrS</b>	Nominal frequency of motor	50.0											
<b>UnS</b>	Nominal voltage of motor	230											

**ATV 16 parameters for MPA-II XN or YN robots**

	Parameters for a PIP ... XN or YN	3010		3020		3030		3040	
		X	Y	X	Y	X	Y	X	Y
<b>Acc</b>	Acceleration time	0.1							
<b>dEc</b>	Deceleration time	0.1							
<b>LSP</b>	Slow speed	0.0							
<b>HSP</b>	High speed	90	45	95	79	110	79	110	90
<b>UFr</b>	Voltage / frequency law	32	75	20	35	19	30	15	18
<b>FLG</b>	Frequency loop gain	nFL							
<b>ItH</b>	Motor thermal protection	2.5		3.0	2.5	3.5	3.0	4.0	3.5
<b>SLP</b>	Slip compensation	OFF							
<b>brA</b>	Deceleration ramp adaptation	OFF							
<b>UFt</b>	Type of voltage / frequency law	L							
<b>tFr</b>	Max. frequency of speed driver	150							
<b>FrS</b>	Nominal frequency of motor	86.0	50.0	86.0					
<b>UnS</b>	Nominal voltage of motor	230							

**ATV 58 parameters for MPA-II XN or YN robots originally equipped with an ATV 58**

	Parameters for a PIP ... XN or YN	3010		3020		3030		3040	
		X	Y	X	Y	X	Y	X	Y
<b>Acc</b>	Acceleration time	0.05							
<b>dEc</b>	Deceleration time	0.05							
<b>LSP</b>	Slow speed	0.0							
<b>HSP</b>	High speed	77	92	95	79	95	79	95	90
<b>UFr</b>	Voltage / frequency law	86	100	50	85	80	80	20	40
<b>STA</b>	Stability	1							
<b>FLG</b>	Frequency loop gain	100							
<b>ItH</b>	Motor thermal protection	3.5							
<b>SLP</b>	Slip compensation	1							
<b>brA</b>	Deceleration ramp adaptation	yes							
<b>tFr</b>	Max. frequency of speed driver	130							
<b>FrS</b>	Nominal frequency of motor	50 for 230 / 400 V motor coupled at 230 V (triangle) 86 for 127 / 230 V motor coupled at 127 V (triangle)							
<b>UnS</b>	Nominal voltage of motor	230							

## Initial SEPRO parameters for ATV 58

Code	Name	Value	Default value
	Macro-configuration		
CFG	Macro-configuration	Hdg:Handling	Hdg:Handling
	Customized	Yes	No
	Adjustments		
ACC	Acceleration	0.05 s	3.0 s
DEC	Deceleration	0.05 s	3.0 s
AC2	Acceleration 2	5.0 s	5.0 s
DE2	Deceleration 2	5.0 s	5.0 s
LSP	Slow speed	0.0 Hz	0.0 Hz
HSP	High speed	105.0 Hz	50.0 Hz
FLG	Gain	100%	20%
STA	Stability	1%	20%
ITH	Motor Thermal Current	3.7 A	3.5 A
IDC	DC Injection Current	2.5 A	2.5 A
TDC	DC Injection time	0.0 s	0.5 s
JPF	Jump frequency	0.0 Hz	0.0 Hz
TLS	Low Speed run time	0.0 s	0.0 s
UFR	IR Compensation	100%	100%
SLP	Slip compensation	1%	100%
PFL	V/f Profile	100%	100%
JOG	JOG Frequency	10.0 Hz	10.0 Hz
JGT	JOG Delay	0.5 s	0.5 s
SP2	Preset speed 2	10.0 Hz	10.0 Hz
SP3	Preset speed 3	15.0 Hz	15.0 Hz
SP4	Preset speed 4	20.0 Hz	20.0 Hz
SP5	Preset speed 5	25.0 Hz	25.0 Hz
SP6	Preset speed 6	30.0 Hz	30.0 Hz
SP7	Preset speed 7	35.0 Hz	35.0 Hz
BRL	Brake release frequency	0.0 Hz	0.0 Hz
IBR	Brake Release current	0.0 A	0.0 A
BRT	Brake Release time	0.00 s	0.00 s
BEN	Brake engage Frequency	0.0 Hz	0.0 Hz
BET	Brake Engage Time	0.00 s	0.00 s
RPG	Proportional gain	1	1
RIG	Integral gain	1.00 /s	1.00 /s
FBS	Feedback Scale	1	1
CTD	Current Detection	5.5 A	5.5 A
FTD	Frequency Detection	50.0 Hz	50.0 Hz
TTD	Motor Thermal State Detection	100%	100%
TL2	Second Torque limit	200%	200%
DTS	Feedback Scale	1	1

	Drive control		
UNS	Nominal Voltage	230 V	230 V
FRS	Nominal Frequency	86.0 Hz	50.0 Hz
NCR	Nominal Current	3.7 A	3.5 A
NSP	Nominal Speed	2386 RPM	1400 RPM
COS	Power Factor	0.7	0.77
TUN	Auto Tune	No	No
TFR	Maximum Output Frequency	130.0 Hz	60.0 Hz
NLD	Energy Saving	No	No
BRA	Decel. Ramp Adaptation	Yes	No
FRT	Switch to Ramp 2 Frequency	0.0 Hz	0.0 Hz
RPT	Type of Ramp	LIN:Linear ramp	LIN:Linear ramp
DCF	Decel. Ramp Reduction Coefficient	4	4
TLI	Torque Limit	200%	200%
CLI	Internal current limit	5.5 A	5.5 A
ADC	Automatic DC Injection	Yes	Yes
PCC	Motor Power Coefficient	1	1
SFT	Switching Frequency type	LF :Low Freq.	LF :Low Freq.
SFR	Switching Frequency	4 kHz	4 kHz
NRD	Motor Noise Reduction	Yes	Yes
SPC	Special motor	No	No
PLS	PG pulse per revolution	1	1
PGT	Type of PG	DET:Detector	DET:Detector
	Command		
TCC	Terminal Strip Configuration	2W :2 wire cntrl	2W :2 wire cntrl
TCT	Type of 2 wire	LEL:2 wire	LEL:2 wire
CRL	AI2 Min. Reference	4.0 mA	4.0 mA
CRH	AI2 Max. Reference	20.0 mA	20.0 mA
STR	Stored Frequency Reference	NO :no Save	NO :no Save
PST	STOP Key Priority	Yes	Yes
ADD	Drive Address	0	0
	I/O Assignments		
LI1	LI1 Assignment	FW :Forward	FW :Forward
LI2	LI2 Assignment	RV :Reverse	RV :Reverse
LI3	LI3 Assignment	RST:Fault Reset	PS2:2 preset SP
LI4	LI4 Assignment	NO :Not assigned	PS4:4 preset SP
LI5	LI5 Assignment	NO :Not assigned	NO :Not assigned
LI6	LI6 Assignment	NO :Not assigned	NO :Not assigned
AI1	AI1 Assignment	FRH:Freq. Ref.	FRH:Freq. Ref.
AI2	AI2 Assignment	SAI:Summed Ref.	SAI:Summed Ref.
AI3	AI3 Assignment	NO :Not assigned	NO :Not assigned
R1	R1 Assignment	FLT:VarFault	FLT:VarFault
R2	R2 Assignment	RUN:DriveRunning	OCC:Output Cont.
LO	LO Assignment	NO :Not assigned	NO :Not assigned

AO	AO Assignment	NO :Not Assigned	NO :Not Assigned
	Fault managment		
ATR	Automatic Restart	No	No
RST	Fault Reset Type	RSP:Part. Reset	RSP:Part. Reset
OPL	Output Phse Loss	Yes	Yes
IPL	Input Phase Loss	No	No
THT	Type of Protection	ACL:Vent. Motor	ACL:Vent. Motor
LFL	Loss of Follower	No	No
FLR	Catch on fly	No	No
STP	Controlled Stop on power loss	No	No
SDD	Ramp not Followed	No	No
	Communication		
PRO	Protocol	Not configured	Not configured
BDR	Transmission Speed	Not configured	Not configured
FOR	Format	Not configured	Not configured
TLP	Time out	1.0 s	1.0 s
PRC	PeerCop...	No	No
GLB	Global Tx	0	0
CDN	Command Node	0	0
REG	Number of Registers	0	0
	Specific card		
O01	Parameter N°1	0	0
O02	Parameter N°2	0	0
O03	Parameter N°3	0	0
O04	Parameter N°4	0	0
O05	Parameter N°5	0	0
O06	Parameter N°6	0	0
O07	Parameter N°7	0	0
O08	Parameter N°8	0	0
O09	Parameter N°9	0	0
O10	Parameter N°10	0	0
O11	Parameter N°11	0	0
O12	Parameter N°12	0	0
O13	Parameter N°13	0	0
O14	Parameter N°14	0	0
O15	Parameter N°15	0	0
O16	Parameter N°16	0	0
O17	Parameter N°17	0	0
O18	Parameter N°18	0	0
O19	Parameter N°19	0	0
O20	Parameter N°20	0	0
	Drive identification		
	Drive catalog number	ATV58*U18M2	
	Drive catalog number	0.75kW 1HP	

	Input Voltage	200/240V
	50/60 Hz Switch position	Produit 50Hz
	Rated continuous current	4.1 A
	Rated continuous current	5.6 A
	Option card	No option card

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Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

## WE'RE HERE TO HELP

To contact Customer Service personnel, call:



## HOW TO CONTACT CUSTOMER SERVICE

**From outside the United States, call: 814-437-6861**

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

### **If you do have a problem, please complete the following checklist before calling Conair:**

- Make sure you have all model, serial and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- Make sure power is supplied to the equipment.
- Make sure that all connectors and wires within and between loading control and related components have been installed correctly.
- Check the troubleshooting guide of this manual for a solution.
- Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- Check that the equipment has been operated as described in this manual.
- Check accompanying schematic drawings for information on special considerations.

## BEFORE YOU CALL ...

*Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.*

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## EQUIPMENT GUARANTEE

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

## PERFORMANCE WARRANTY

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

## WARRANTY LIMITATIONS

**Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.**