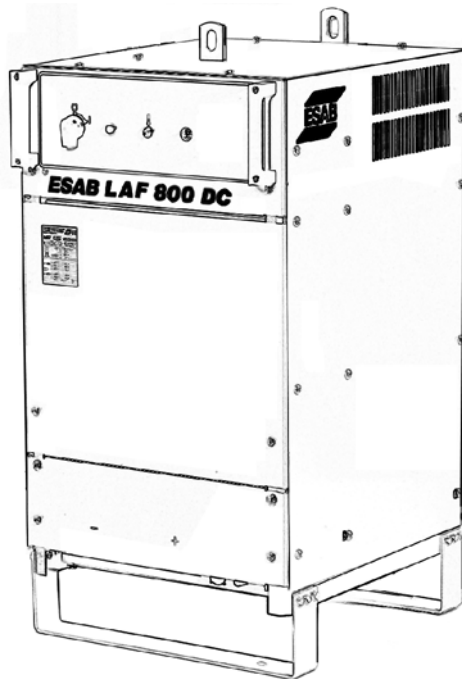
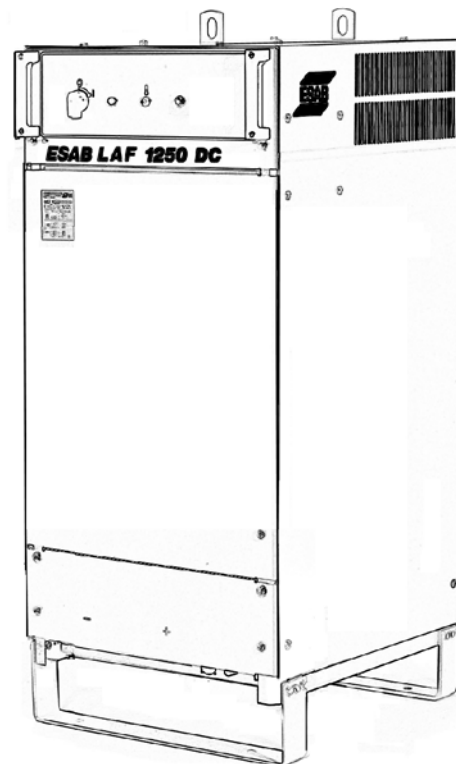


Parallel connection of LAF-Welding power sources



Master



Slave

Installation manual

ENGLISH 3

Rights reserved to alter specifications without notice.

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1 SAFETY

Users of ESAB welding equipment have the ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions. Safety precautions must meet the requirements that apply to this type of welding equipment. The following recommendations should be observed in addition to the standard regulations that apply to the workplace.

All work must be carried out by trained personnel well-acquainted with the operation of the welding equipment. Incorrect operation of the equipment may lead to hazardous situations which can result in injury to the operator and damage to the equipment.

1. Anyone who uses the welding equipment must be familiar with:
 - its operation
 - location of emergency stops
 - its function
 - relevant safety precautions
 - welding
2. The operator must ensure that:
 - no unauthorised person is stationed within the working area of the equipment when it is started up.
 - no-one is unprotected when the arc is struck
3. The workplace must:
 - be suitable for the purpose
 - be free from draughts
4. Personal safety equipment
 - Always wear recommended personal safety equipment, such as safety glasses, flame-proof clothing, safety gloves.
 - Do not wear loose-fitting items, such as scarves, bracelets, rings, etc., which could become trapped or cause burns.
5. General precautions
 - Make sure the return cable is connected securely.
 - Work on high voltage equipment **may only be carried out by a qualified electrician.**
 - Appropriate fire extinguishing equipment must be clearly marked and close at hand.
 - Lubrication and maintenance must **not** be carried out on the equipment during operation.



WARNING



ARC WELDING AND CUTTING CAN BE INJURIOUS TO YOURSELF AND OTHERS. TAKE PRECAUTIONS WHEN WELDING. ASK FOR YOUR EMPLOYER'S SAFETY PRACTICES WHICH SHOULD BE BASED ON MANUFACTURERS' HAZARD DATA.

ELECTRIC SHOCK - Can kill

- Install and earth the welding unit in accordance with applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from earth and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES - Can be dangerous to health

- Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to take fumes and gases away from your breathing zone and the general area.

ARC RAYS - Can injure eyes and burn skin.

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

NOISE - Excessive noise can damage hearing

- Protect your ears. Use earmuffs or other hearing protection.
- Warn bystanders of the risk.

MALFUNCTION - Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

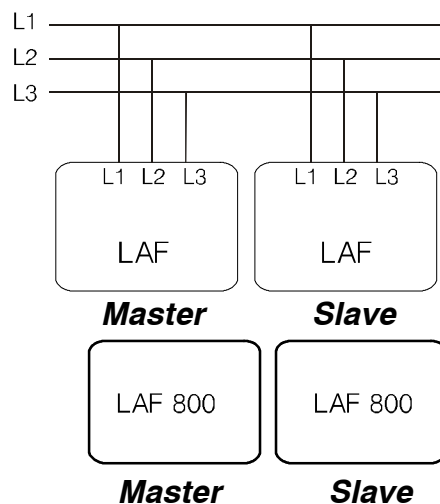
2 INTRODUCTION

2.1 General

Connection in parallel can be done with all sizes of the LAF welding power source. The current outlet from each welding power source depends on its size, see below.

The mains connection is to be done in the same way for **Master** and **Slave**.

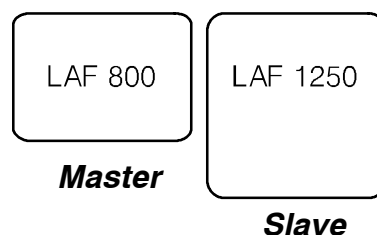
It is possible to use the so-called six-thyristor effect by inverting the primary terminal of the main transformer, see page 11.



Connection in Parallel of Welding Power Sources of the Same Size

Connection in Parallel of Welding Power Sources of Different Size

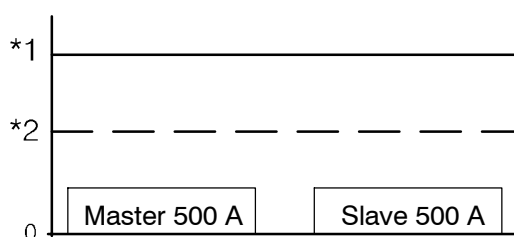
When the welding power sources are of different size the smallest one is to be **Master**.



Current Outlet for Welding Power Sources of the Same Size

If the power sources are of the same size the current outlet will be evenly distributed.

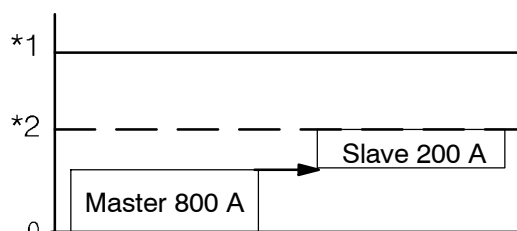
- *1 Max = 1600 A
- *2 500+500 = 1000 A



Current Outlet for Welding Power Sources of Different Size

If the Welding power sources are of different size the Master will be charged at 80% before the Slave is connected. This distribution is done automatically by the welding power sources.

- *1 Max = 2050 A
- *2 800+200 = 1000 A



2.2 Setting of Switches and Bridges

If LAF2 comes last in the network the bridge **BY1** shall be switched on, whereas on LAF1 **BY1** shall be switched off.

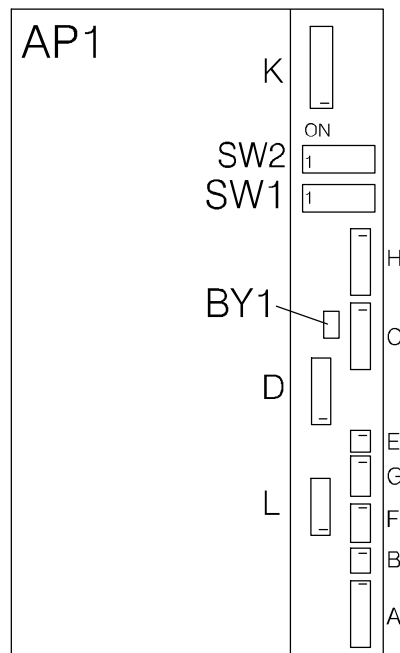
1 8

In order to make LAF2 act as Slave, set the DIP switch (SW1) to 11101011 .

NB!

LAF1 (Master) must be switched on first, after that the LAF2 (Slave) should be switched on.

If they are not powered in this order the Master/Slave configuration will not work and no value will be received from LAF2 (Slave).

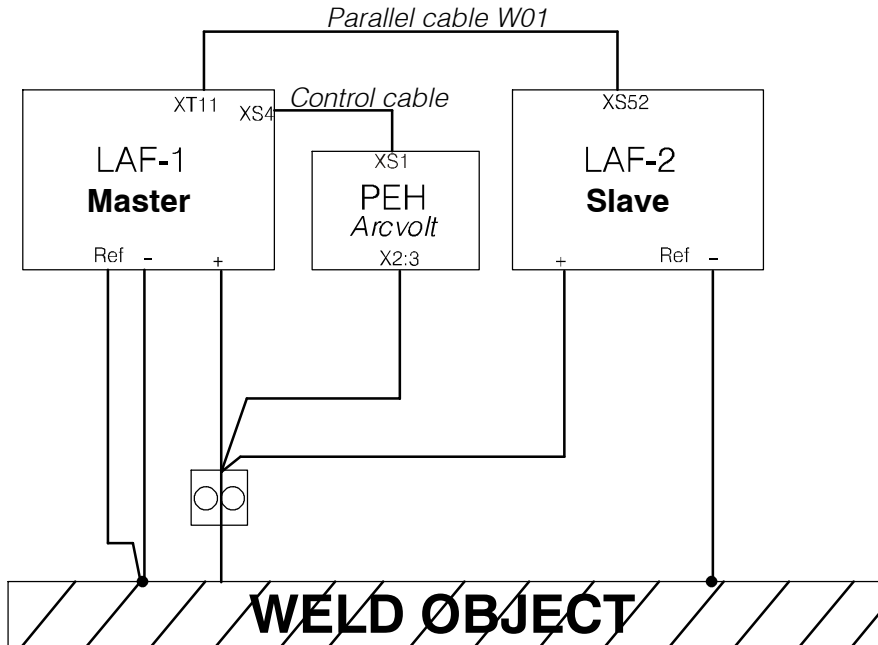


2.3 Parallel connection kit

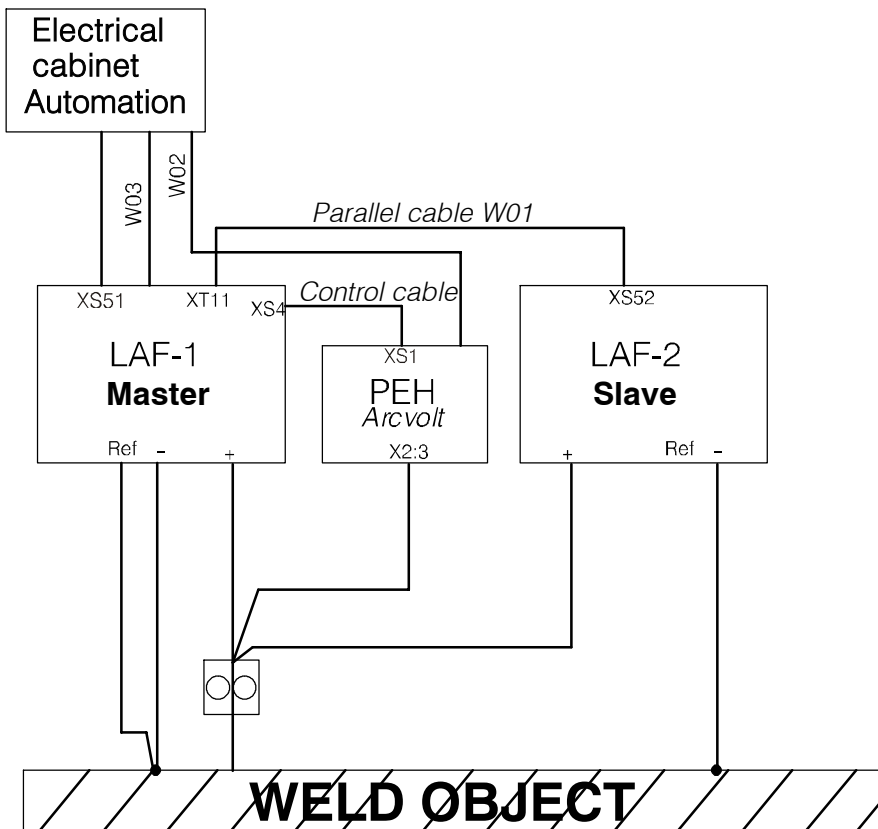
A kit for connection in parallel of the LAF welding power sources is available both for automation and for tractors. Only the emergency stop circuit differs.

See the spare parts list on page 17.

Parallel connection (kit for Tractor version, 0808573880)



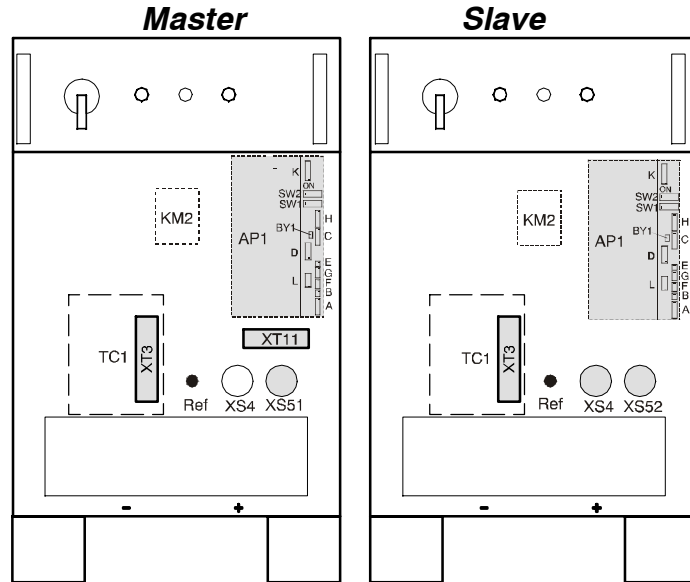
Parallel connection (kit for Automation version, 0808573881)



3 Location Drawing

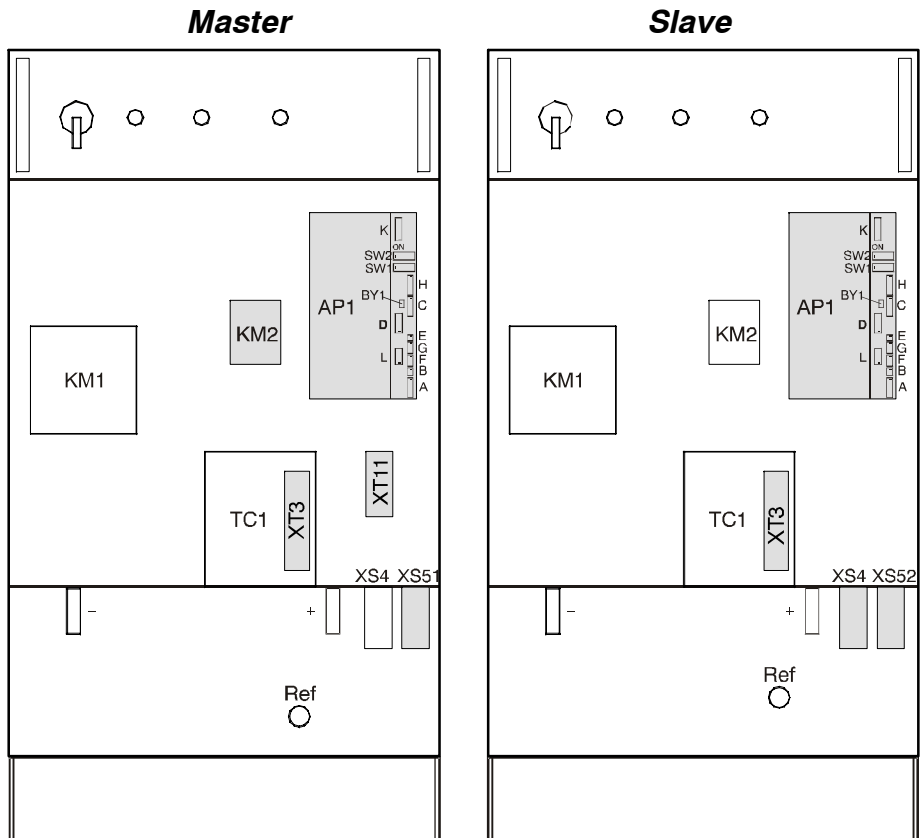
3.1 Parallel connection kit - Welding Power Source LAF 635

Note that XS51 only is available for the automation variant (0808573881).



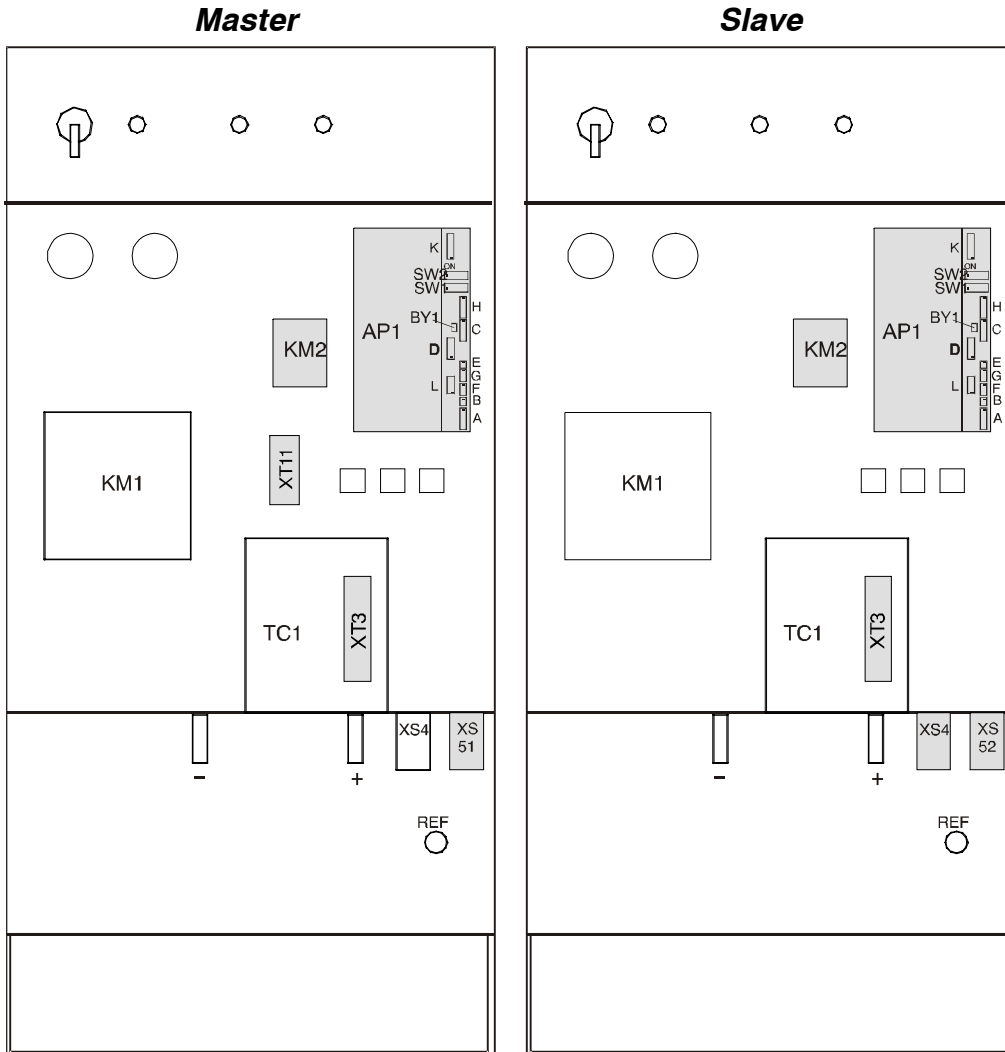
3.2 Parallel connection kit - Welding Power Source LAF 800/1000

Note that XS51 only is available for the automation variant (0808573881).



3.3 Parallel connection kit - Welding Power Source LAF 1250/1600

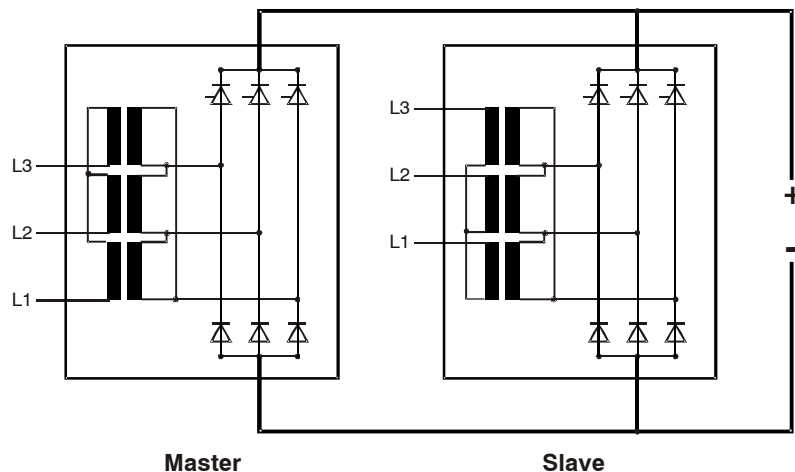
Note that XS51 only is available for the automation variant (0808573881).



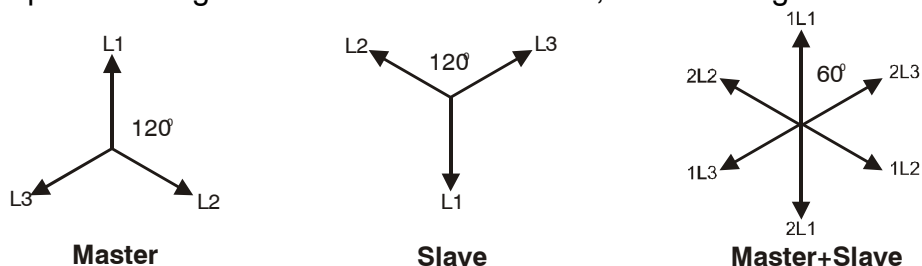
4 Connection in Parallel Using Six-Thyristor Operation

In this case the Master/Slave welding power sources are connected to the mains by way of six thyristors (three in each welding power source). This results in softer welding current as the phase shift is 60° instead of 120° .

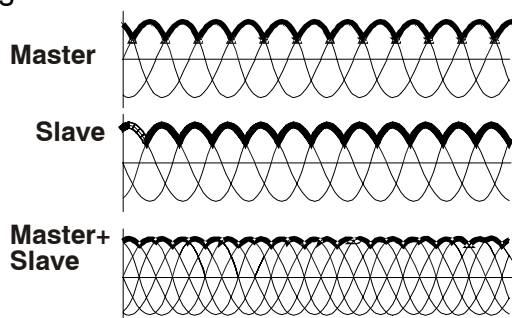
- Connection of Master+Slave using the six-thyristor effect. Note that the primary winding of the Slave is reversed.



- The phase shift goes down from 120° to 60° , see the diagrams below.



- The following sine-wave diagram shows the equalising effect obtained when using inversion of the Slave transformer.

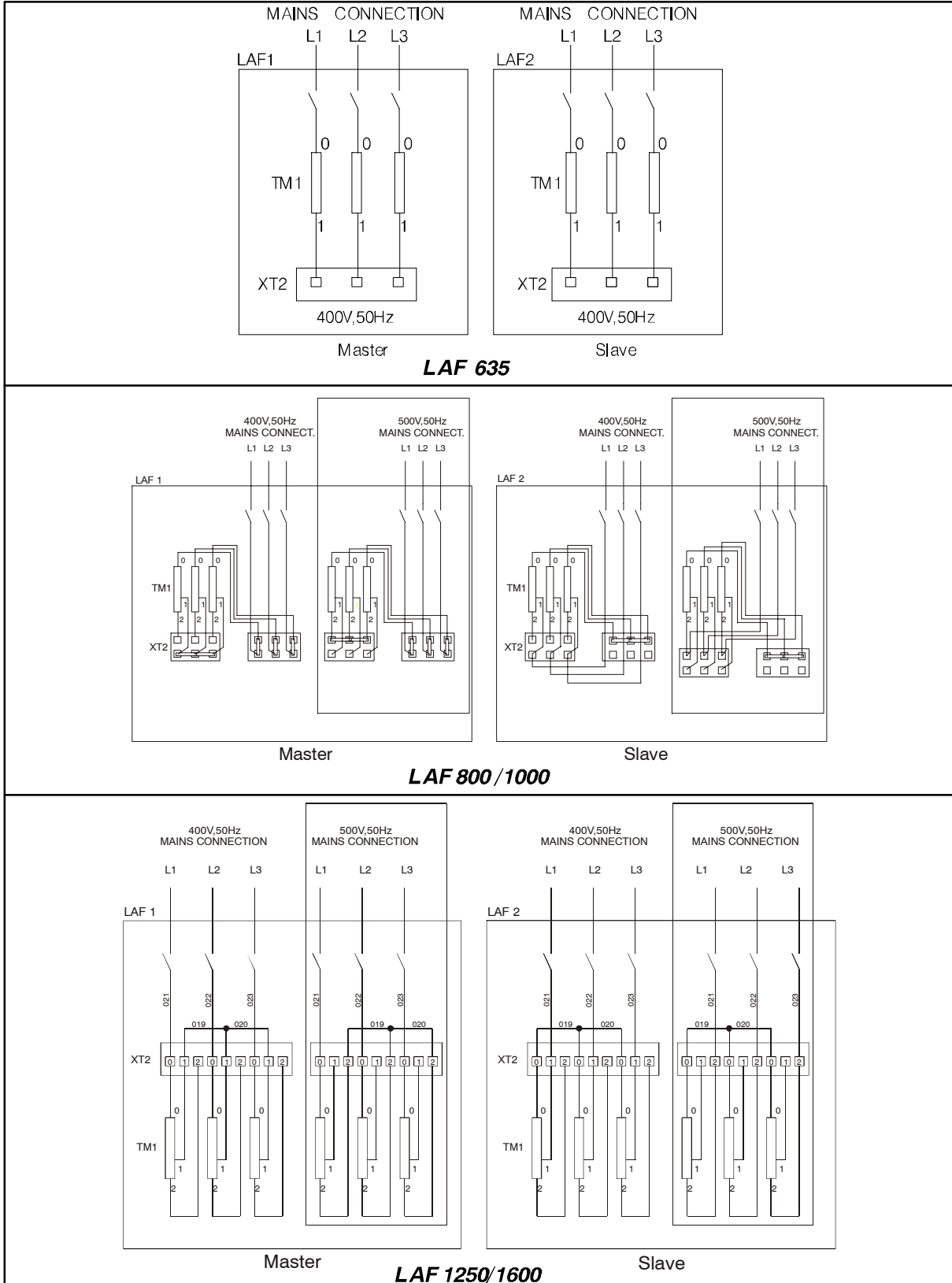


The requirement is that the welding power sources are of the same size, and that it is possible to shift the input and output on the primary side of the main transformer. This is easily done on LAF 800, 1000, 1250 and 1600, whereas it is more complicated on LAF 635, as the winding of the transformer is connected directly to the main contactor.

IMPORTANT!

Connect the right winding. Most power sources have more than one mains voltage. This applies particularly to machines designed for different mains voltages.

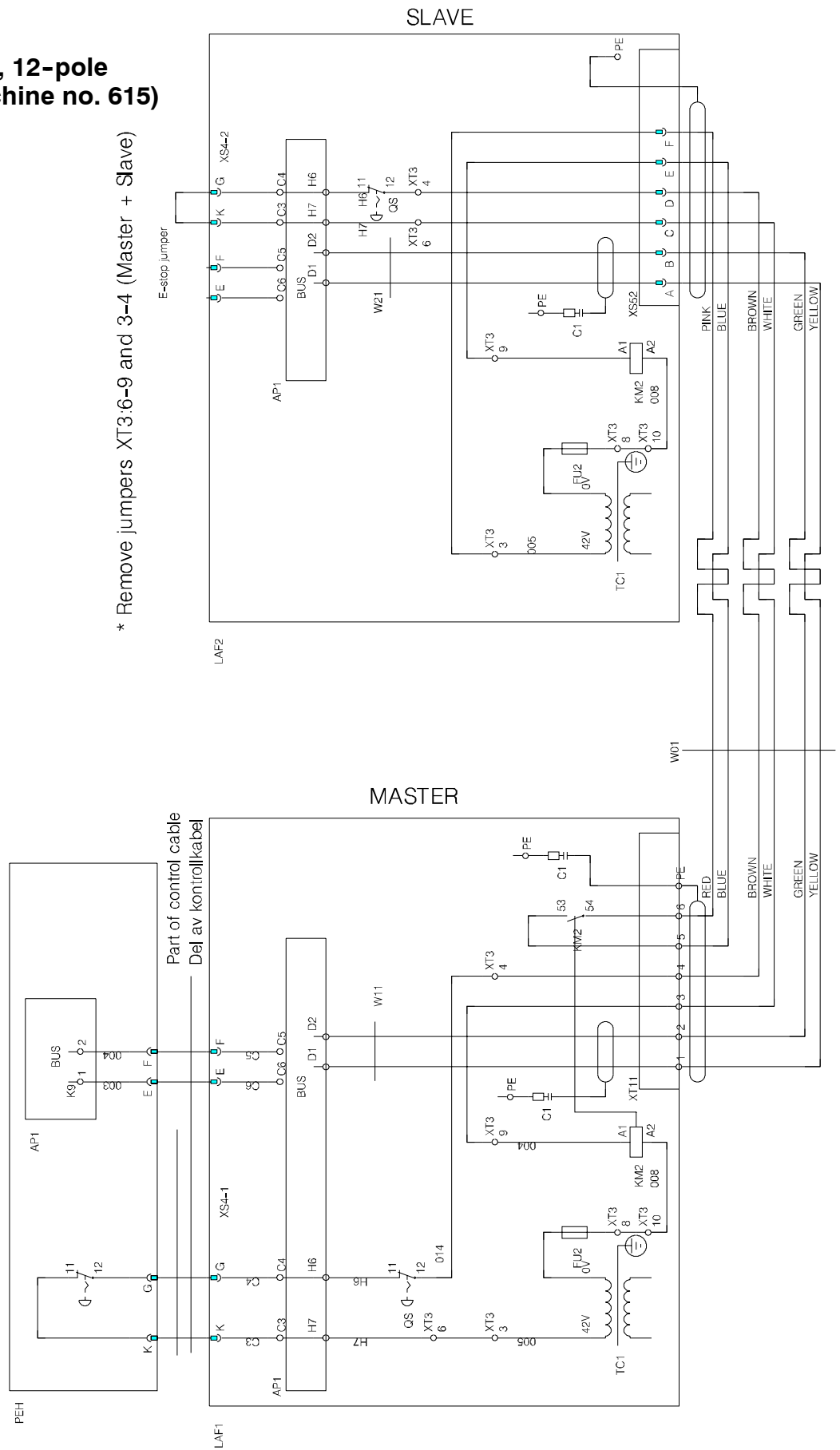
Below you find examples how to connect master and slave to the mains when using power sources without multivoltage connections.



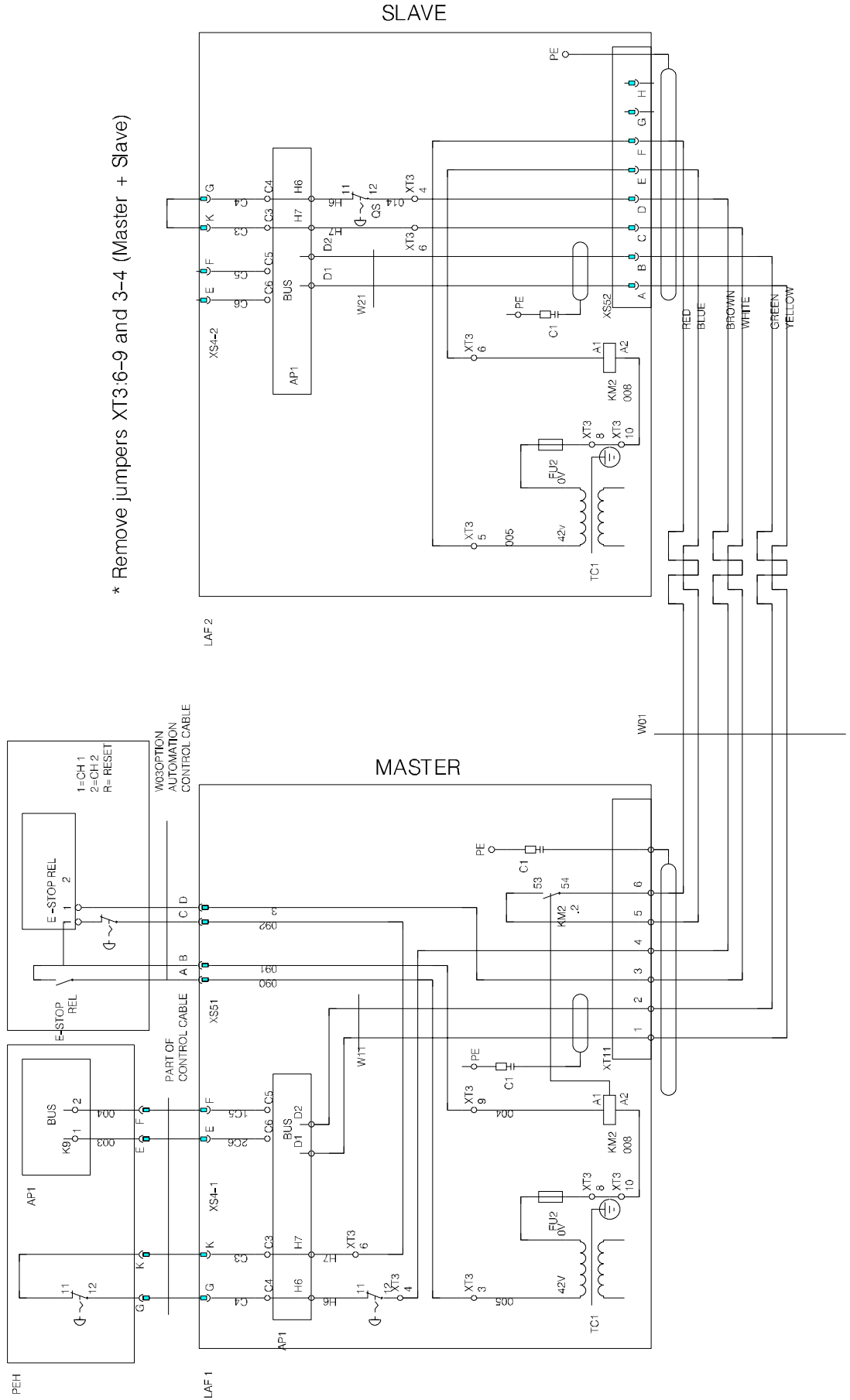
Diagram

**Tractor version, 12-pole
(valid from machine no. 615)**

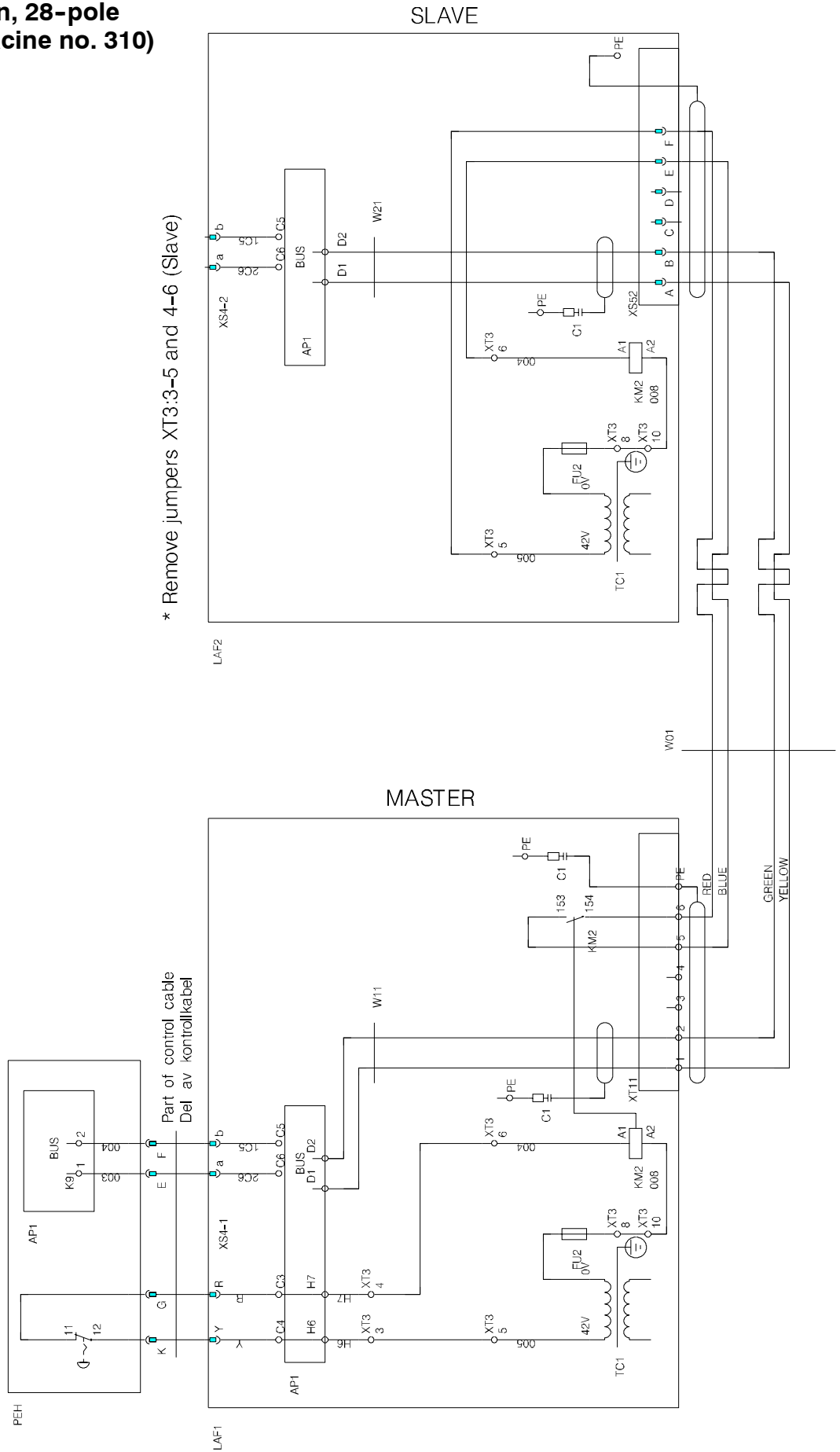
* Remove jumpers XT3 6-9 and 3-4 (Master + Slave)



Automation version, 12-pole (valid from machine no. 615)

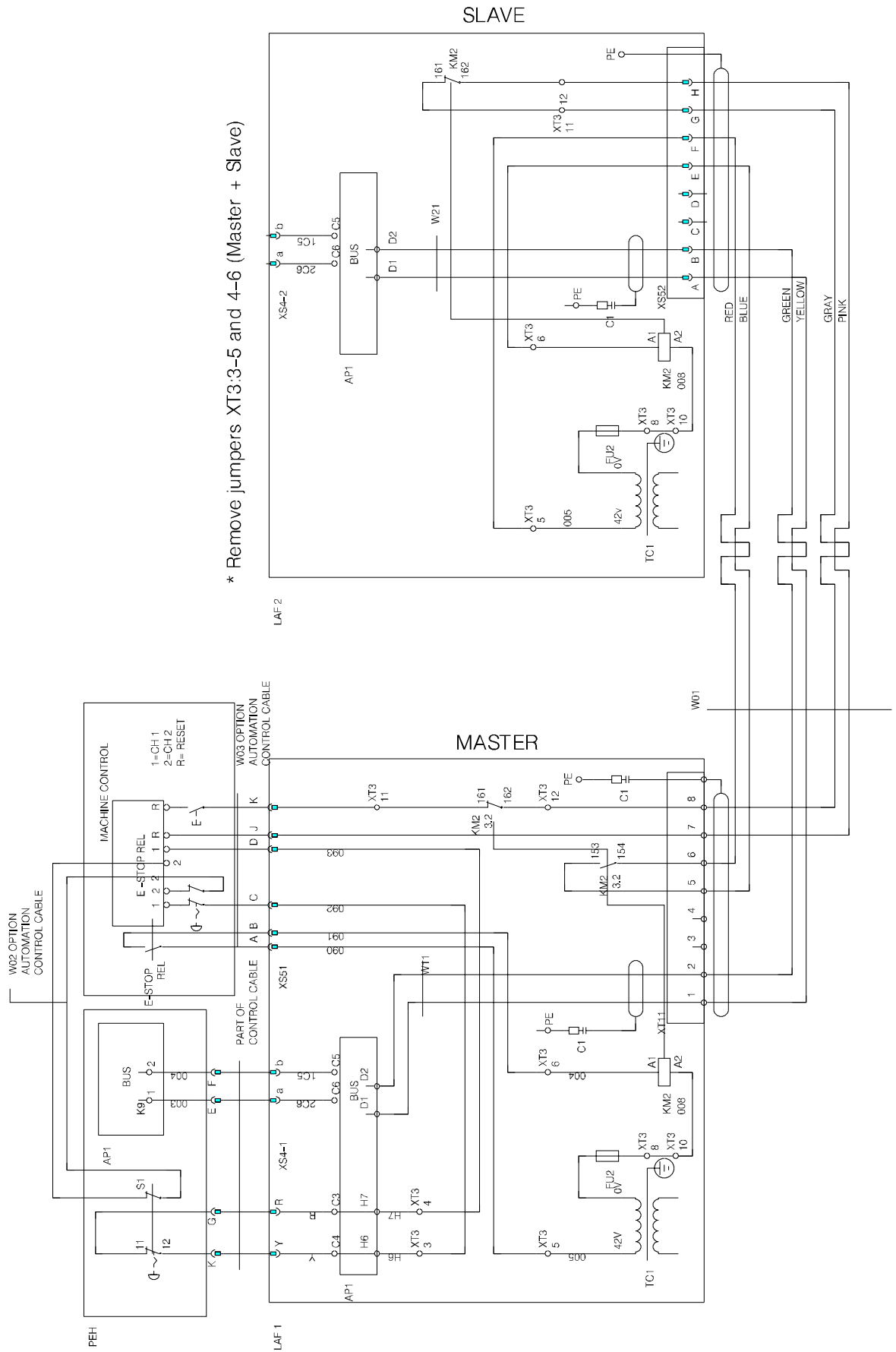


**Tractor version, 28-pole
(valid from machine no. 310)**



* Remove jumpers XT3:3-5 and 4-6 (Slave)

Automation version, 28-pole (valid from machine no. 310)



Spare parts list

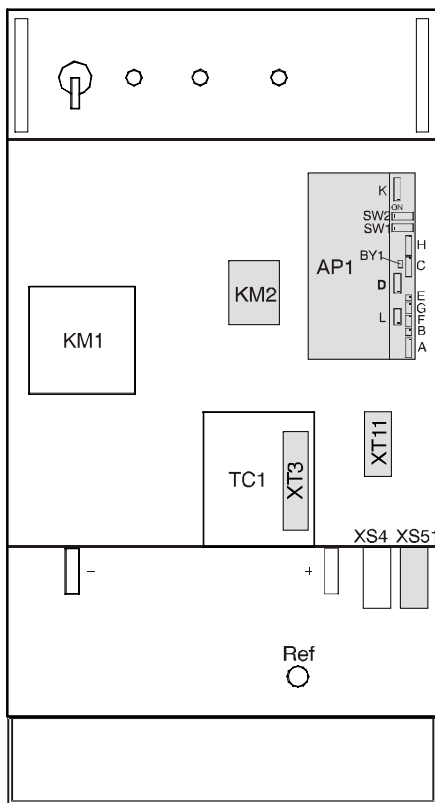
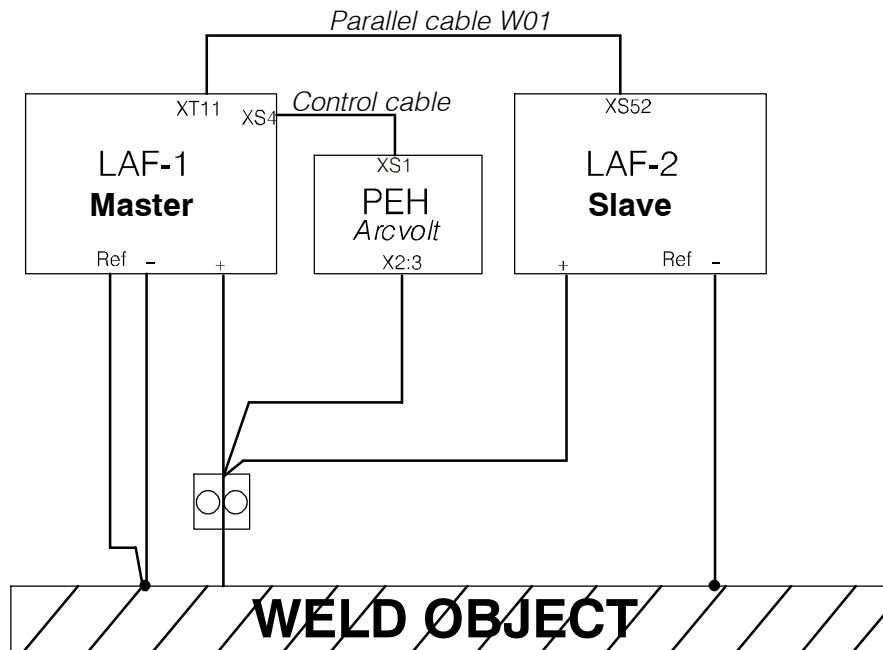
Edition 2004-05-11

Ordering no.	Denomination	Notes
0808573880	Kit, Traktor version	
0808573881	Kit, Automation version	

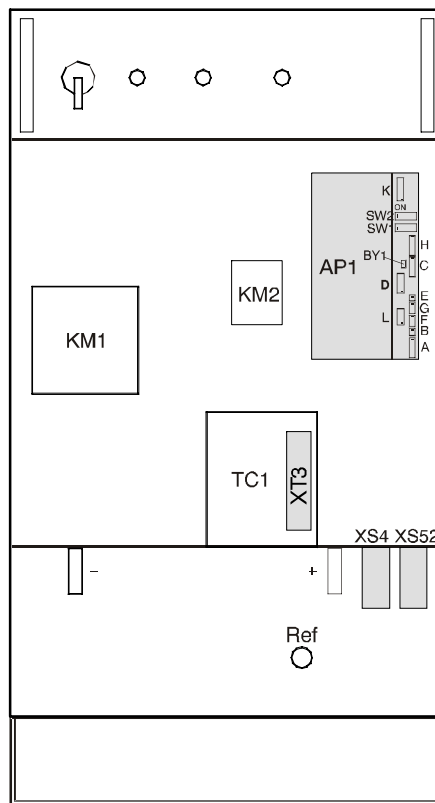
Item no.	Qty	Ordering no.	Denomination	Notes	*	**
		0808573880	Parallel connection	LAF, Tractor		
KM21	1	0436919007	Auxiliary contact	Emergency stop	X	
W01	4	0801389053	Cable LIYCY 4*2*0,5	Bus+Emergency stop, 4m	X	X
	1	0368542003	Sleeve plug Burndy	12-pole	X	X
	8	0323945005	Sleeves		X	X
W11	2	0191812101	Cable	Bus, MKFR 0,22*2*1	X	X
	1	0456489002	Circuit board connection	6-pole for AP1-D	X	X
W21	2	0191812101	Cable	Bus, MKFR 0,22*2*1	X	X
	1	0456489002	Circuit board connection	6-pole for AP1-D	X	X
	2	0323945005	Pin	0,13-0,20	X	X
XS4-2	1	0368541003	Pin plug Burndy	12-pole, Emergency stop	X	
	2	0323945004	Pin	0,52-1,50	X	
	0,1	0809388001	Cable	RK 1 Black, 0,1m	X	
XS52	1	0368543003	Pin outlet Burndy	12-pole	X	X
	4	0323945004	Pin	0,52-1,50	X	X
XT11	1	0193655012	Connection block	12-pole cut to 7-pole	X	X
10	5m	0809388001	Cable	RK 1 Black	X	X

* Components that are to be used if XS4 is 12-pole (machine no. 615)

** Components that are to be used if XS4 is 28-pole (machine no. 310)



Master

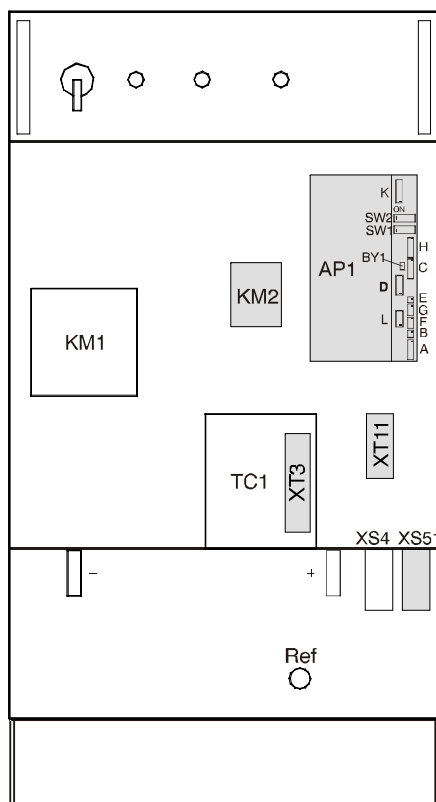
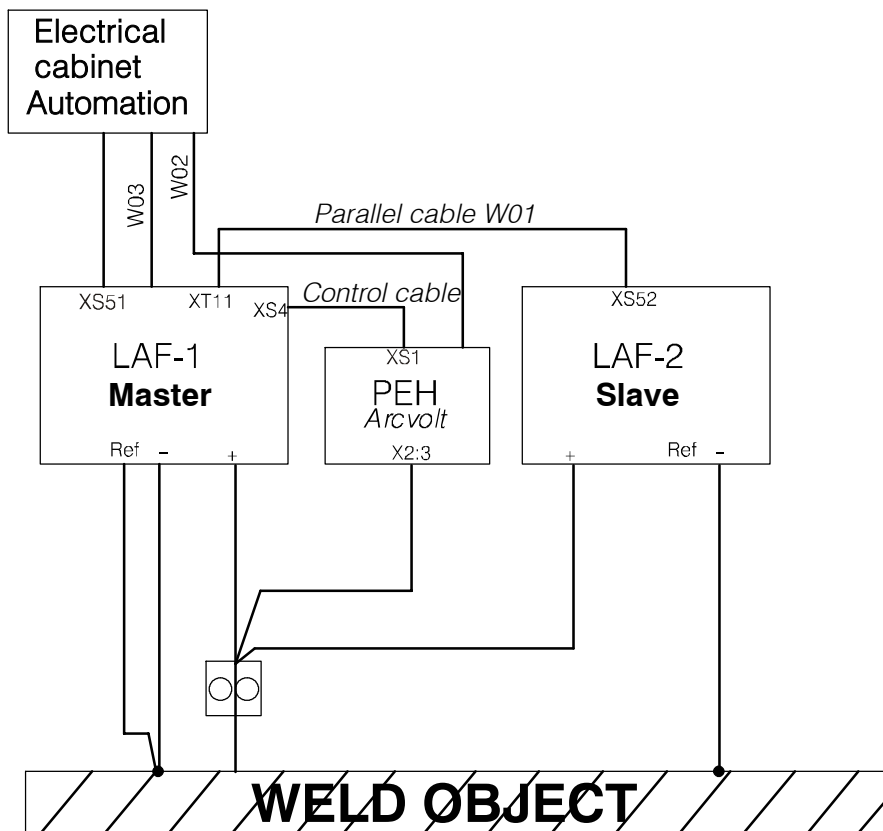


Slave

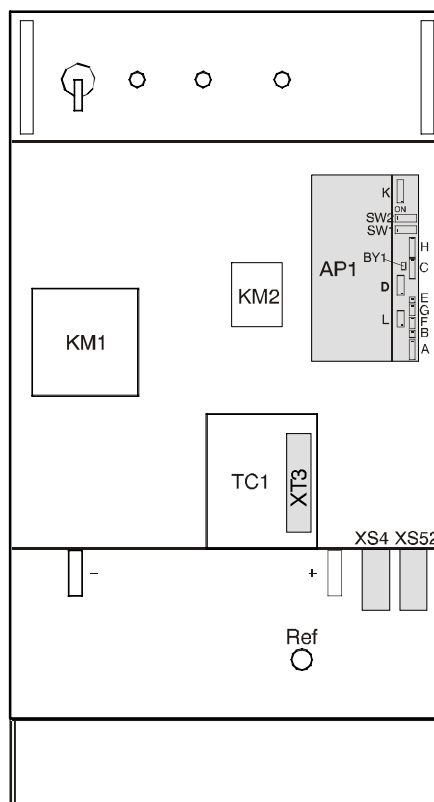
Item no.	Qty	Ordering no.	Denomination	Notes	*	**
		0808573881	Parallel connection	LAF, Automation		
KM21	1	0436919007	Auxiliary contact	Emergency stop	X	
W01	4	0801389053	Cable LIYCY 4*2*0,5	Bus+Emergency stop, 4m	X	X
	1	0368542003	Sleeve plug Burndy	12-pole	X	X
	8	0323945005	Sleeves		X	X
W11	2	0191812101	Cable	Bus, MKFR 0,22*2*1	X	X
	1	0456489002	Circuit board connection	6-pole for AP1-D	X	X
W21	2	0191812101	Cable	Bus, MKFR 0,22*2*1	X	X
	1	0456489002	Circuit board connection	6-pole for AP1-D	X	X
	2	0323945005	Pin	0,13-0,20	X	X
XS4-2	1	0368541003	Pin plug Burndy	12-pole Emergency stop	X	
	2	0323945004	Pin	0,52-1,50	X	
	0,1m	0809388001	Cable		X	
XS51	1	0368543003	Pin outlet Burndy	12-pole	X	X
	2	0323945005	Pin	0,13-0,20	X	X
	4	0323945004	Pin	0,52-1,50	X	X
XS52	1	0368543003	Pin outlet Burndy	12-pole	X	X
	4	0323945004	Pin	0,52-1,50	X	X
XT11	1	0193655012	Connection block	12-pole cut to 7-pole	X	X
10	5m	0809388001	Cable	RK 1 Black	X	X
W02		0802803002	Cable (specify the correct cable length when ordering)	2x0.5 mm ²	X	X
W03		0802803008	Cable (specify the correct cable length when ordering)	7x0.5 mm ²	X	X
S1	1	0443740002	Contact block (Emergency stop push-button)		X	X

* Components that are to be used if XS4 is 12-pole (machine no. 615)

** Components that are to be used if XS4 is 28-pole (machine no. 310)



Master



Slave

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