Jetter
automation



User Manual

JM-100x-S1

Servo Amplifier

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1 General information

1.1 Documentation

This installation manual contains information on how to mount, install, commission, use the device in accordance with its intended purpose, service, and decommission the device in a drive system.

For further information refer to the following information products:

- Description of safety function STO
- JetSym Online Help

These documents must be available to all persons involved in handling or operating this system or its components. These persons must observe the relevant safety information.

1.2 Acronyms used in this document

BLDC	Brushless DC motor
EMC	Electromagnetic compatibility
PE	Protective Earth
PELV	Protective Extra Low Voltage
SELV	Safety Extra Low Voltage
SM	Stepper motor
UZK	DC link voltage

1.3 Scope of delivery and accessories

The following items are included in the scope of delivery:

- Servo amplifier, mating connector for power and motor connector (X1), and I/O interface (X10) included

Not included in the scope of delivery:

- D-Sub, and RJ45 mating connectors, as well as SD card, power lead, and ballast resistor.

ⓘ INFO

Ordering accessories

The accessories are not part of the scope of delivery.

Suitable accessories can be obtained from Jetter AG.

2 Safety

At the time of placing on the market, this product corresponds to the current state of the art and meets the recognized safety rules.

Besides the user manual, the rules and regulations in the operator's country are relevant to the operation of the product. These rules are defined by laws, regulations, accident prevention regulations, and safety rules.

The operating voltage of this device is classified as SELV (Safety Extra Low Voltage) and is therefore not subject to the EU Low Voltage Directive.

The operator is responsible for complying with the duties mentioned below:

- Applicable legislation, rules, and regulations
- Relevant accident prevention regulations
- Accepted safety rules
- EU directives and other country-specific regulations

2.1 Warnings used in this document

⚠ DANGER



High risk

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING



Medium risk

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION



Low risk

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE



Material damage

Indicates a situation which, if not avoided, could result in malfunctions or material damage.

2.2 General Safety Instructions

Development of heat

This device heats up in operation. To avoid burns or damages due to heat, install the device in a location that offers adequate protection. Safeguard the device against contact and make sure that there is sufficient airflow to cool the device.

Shipment and packaging

The device contains electrostatically sensitive components which can be damaged if not handled properly. Damages to the device may impair its reliability.

To protect the device from impact or shock, it must be shipped in its original packaging or in an appropriate protective packaging.
In case of damaged packaging inspect the device for any visible damage, and inform your freight forwarder and Jetter AG of the damage caused during shipment.
If the device is damaged or has been dropped, it is strictly forbidden to use it.

Storage

When storing the device observe the environmental conditions given in chapter “Technical specifications”.

Modifications and alterations to the device

Modifications and alterations to the device and its functions are not allowed. In the case of modifications to the device, any liability is excluded.

The original parts are specifically designed for the device. Parts and equipment from other manufacturers must, therefore, not be used.

Any liability for any damages resulting from the use of non-original parts and equipment is excluded.

Target groups

This document is intended for specialists with appropriate qualifications.
Only competent and trained personnel is allowed to put this device into operation.
During the whole product life cycle, safe handling and operation of the device must be ensured. In the case of missing or inadequate technical knowledge or knowledge of this document any liability is excluded.

Maintenance

This device is maintenance-free.
Therefore, for the operation of the device no inspection or maintenance is required.

Repairs

Defective components could cause dangerous malfunctions and could compromise safety.
Only the manufacturer is allowed to repair the device.
Do not open the device!

2.3 Protection against hazards

⚠ DANGER



Electric shock

High voltage caused by wrong connection.

► Mind the relevant safety regulations.

3 Purpose

3.1 Intended conditions of use

This servo amplifier is intended for installation in electrical systems or machines. It may only be commissioned as an integrated component of such a system or machine.

Connect only electric motors and encoders to this device. Operate the device only in accordance with the intended conditions of use, and within the limits set forth in the technical specifications. Operate the servo amplifier only in a closed control cabinet. The specified installation conditions must be complied with.

This servo amplifier is a product which can be used in drive systems of category C2 (industrial environment) according to EN 61800-3. To this end, the design of the system must be EMC-compliant.

Usage as agreed upon includes operation in accordance with this manual.

3.2 Usage other than intended

Do not operate the device under conditions exceeding the technical specifications given in this manual and application examples. Noncompliance with the safety information is regarded as “usage other than intended”.

The device must not be operated under operating conditions that differ from the specified ambient conditions.

If the device is used in any way other than intended, Jetter AG shall assume no liability.

4 Product description

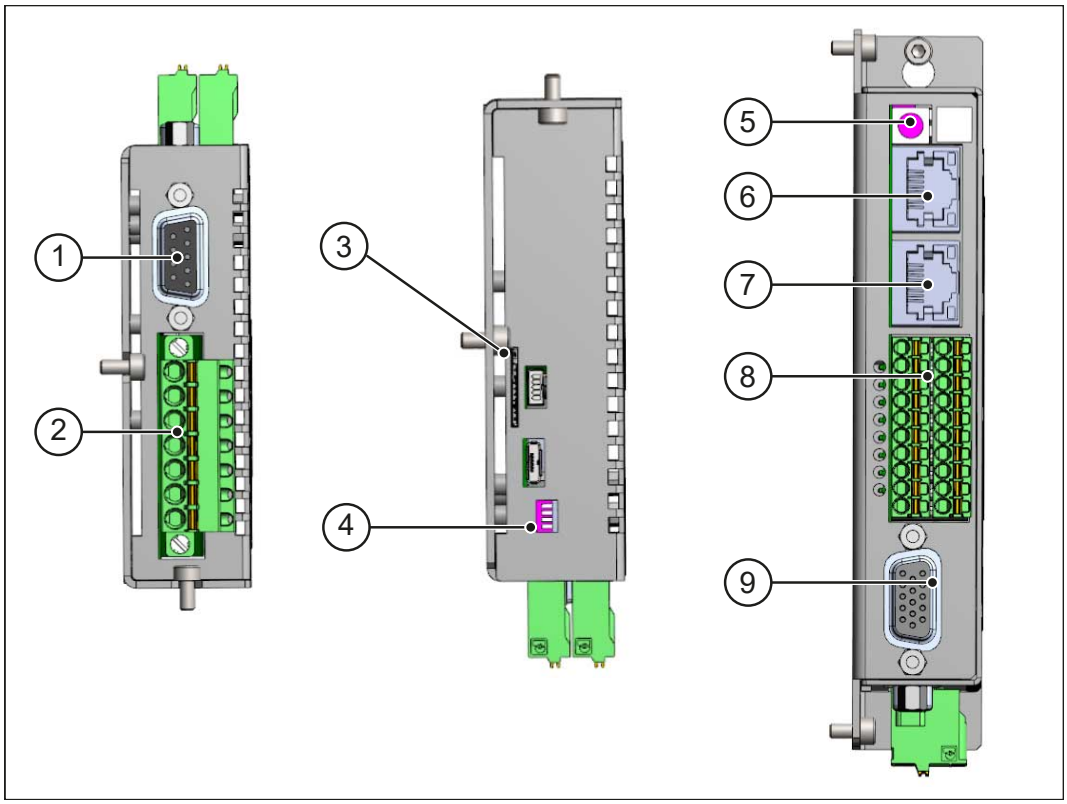


Fig. 1: Connections

1	Encoder connector X61	2	Power and motor connector X1
3	SD card X22	4	DIP switch S2
5	Address selector S1, optional	6	Fieldbus interface IN X18
7	Fieldbus interface OUT X19	8	I/O interface X10
9	Encoder connector X62	10	

4.1 Nameplate

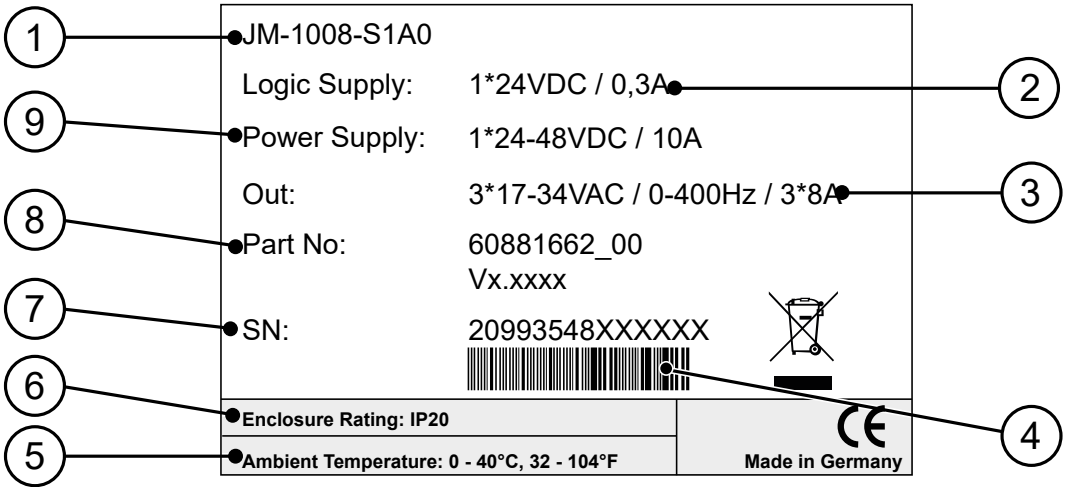


Fig. 2: Nameplate of the servo amplifier

1	Model code number	2	Control voltage
3	Output values	4	Bar code
5	Ambient temperature	6	Enclosure IP class
7	Serial number	8	Part number
9	Power connection		

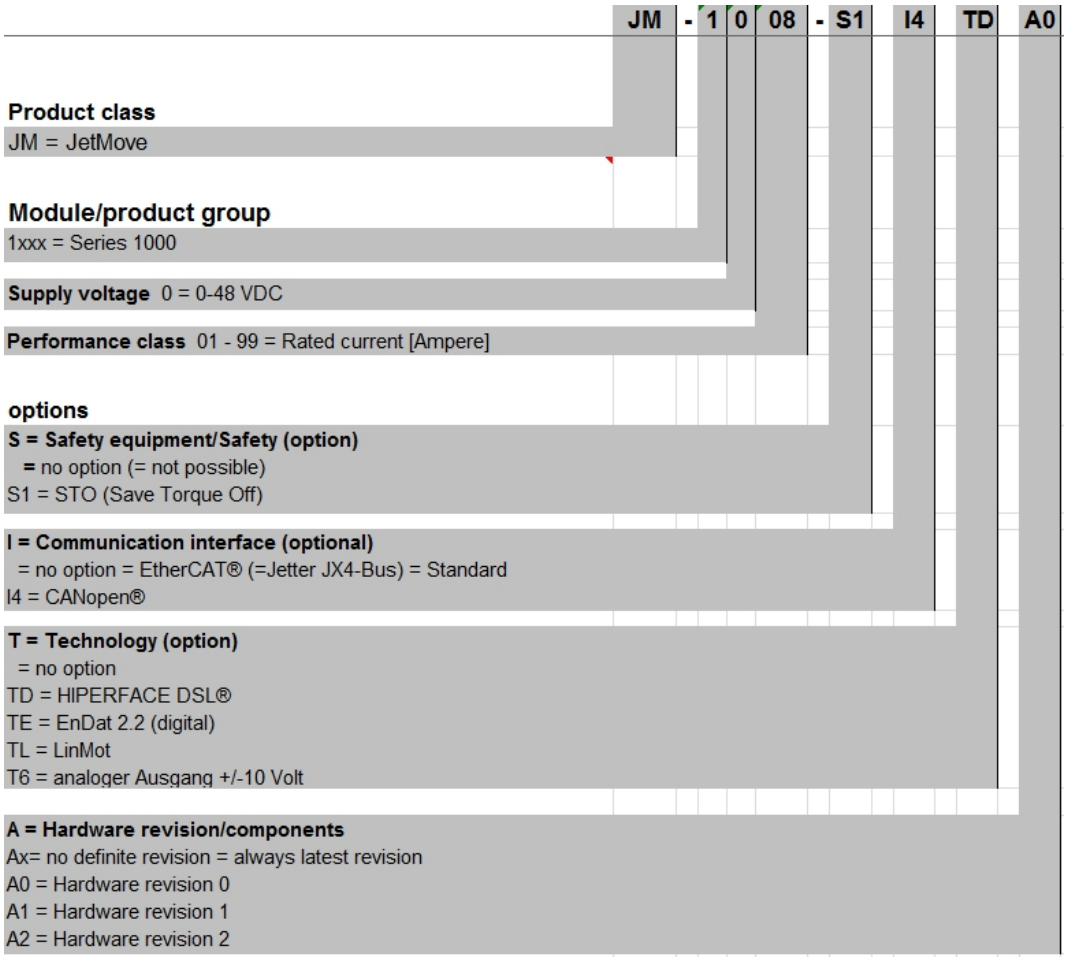
Serial number

The serial number consists of the following elements:

YY	Year of manufacture
WW	Week of manufacture
127590	Production-specific code
XXXX	4 digit consecutive device number, devices produced this week/year

4.2 Type key

The type key consists of the following elements:



4.3 System overview

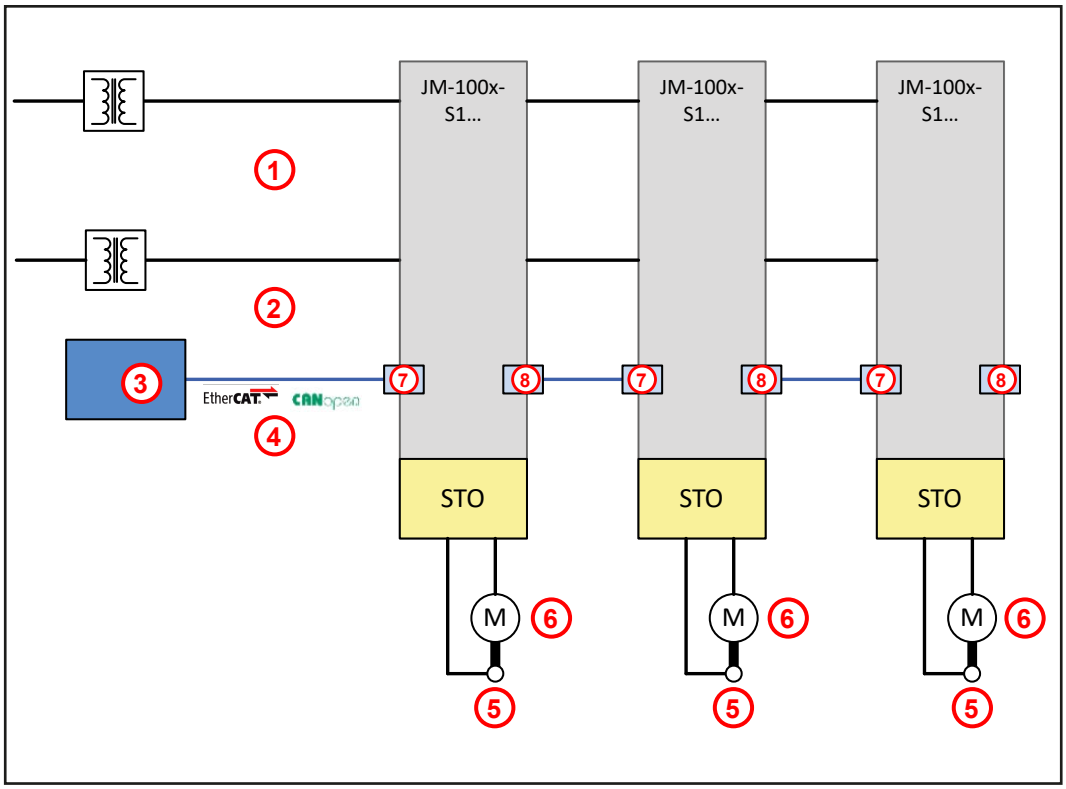


Fig. 3: System overview

1	Power connection (X1), (power supply), SELV / PELV, DC 24 V to DC 48 V
2	Control voltage (X10), (logic supply), SELV / PELV, DC 24 V
3	Controller
4	Field bus
5	Encoder
6	Motor
7	Field bus input
8	Field bus output

5 Technical specifications

This chapter contains information on electrical and mechanical data as well as operating data of the JM-100x.

5.1 Dimensions

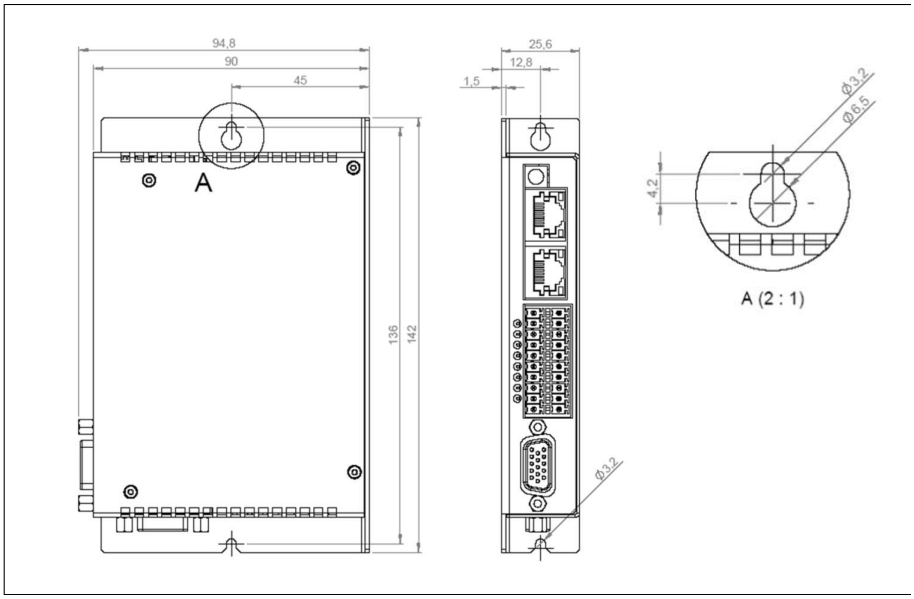


Fig. 4: Dimensions

5.2 Enclosure properties and operating conditions

Enclosure	
Material	Galvanized steel plate
Degree of protection	IP20
Allowed pollution	Pollution degree 2 to EN 61800-5-1 (To avoid conductive pollution, the device must be installed in a control cabinet to IP54)
Mechanical installation	Screwed to a conductive and grounded mounting panel
Total weight	0.41 kg

Operating conditions	
Mounting orientation	Vertical Power and motor connector X1 must point downwards
Clearance	≥ 25 mm above, below, and sidewards
Cooling	Natural convection
Max. installation altitude	1000 m above sea level Installation altitude > 1000 m on request
Ambient temperature in operation	0 °C … +40 °C
Relative humidity	5 % … 85 %, non-condensing

5.3 Environmental conditions - Storage and shipment

Transport conditions		
Ambient temperature	- 25 °C … +70 °C	
Air humidity	5 % … 95 %, non-condensing	
Mechanical conditions	2M5	EN 60721-3-2:2018
Storage conditions		
Ambient temperature	- 25 °C … +55 °C	
Air humidity	5 % … 95 %, non-condensing	
Maximum storage period	1 year without restrictions	

5.4 Electrical data

Control voltage	
Port	X10:1, X10:2
Input voltage	24 V DC (-15 % … +20 %) SELV or PELV
Input current	300 mA at 24 V

Motor power supply	
Connector	X1:6, X1:7
Input voltage	24 … 48 V DC
System-independent protective measures	SELV or PELV
Regeneration	Up to 60 V DC
Max. input current	10 A
DC link capacitance	470 µF

Motor connection	
Connector	X1:1 to X1:4
Output voltage	4 x 0 … 34 V AC
Output frequency	0 … 400 Hz
Output current	8 A
Peak current	16 A for 8 s max.
Ballast resistor	> 3 Ω

5.5 I/O interface X10

Motor holding brake			
Connection	X10:3, X10:4		
Max. output current	500 mA		
SI inputs and digital 24 V inputs			
Input voltage	Min.	Typ.	Max.
ON	+15 V	+24 V	+30 V
OFF	-3 V	0 V	+5 V
Input current			5 mA
Cable length	Max. 30 m		
Analog inputs			
Connection	X10:16, X10:20		
Voltage range	-10 V … 10 V		
Design	Differential inputs		
Resolution	12 bits		
Sampling interval	1 ms		
STO checkback contact			
Connection	X10:9, X10:10		
Design	PhotoMos relay (NO contact)		
Rated current	< 100 mA (not short-circuit-proof)		

5.6 Position encoder connector

Properties	
D-Sub connector (male)	Metal or ABS, metalized, IP20; With M3 locking screw
Cable type	Twisted in pairs
Core cross-section	According to the instructions given by the encoder manufacturer
Shielding connection	Shield connected to enclosure of drive module via metalized D-Sub connector.
Max. cable length	The manufacturer’s instructions must be followed (up to 100 m possible)
Resolver X61	
Suitable resolvers	Two-phase resolvers
Gear ratio	0.5
Reference frequency	8 kHz
Resolution	12 bits
Max. speed	6000 min^{-1}
HIPERFACE DSL X61	
Suitable encoders	No restrictions
Sine/cosine encoder X62	
Suitable encoders	With or without reference signal
Power supply	5 V
Voltage level	1 Vss
Max. frequency	100 kHz
Incremental encoder X62	

Properties	
Suitable encoders	5 V differential signals (RS-422) with or without reference signal
Max. frequency	500 kHz
Digital Hall sensors X62	
Suitable encoders	No restrictions
EnDat 2.2	
Suitable encoders	No restrictions
Motor temperature monitoring	
Digital sensors	Thermal circuit-breaker, PTC
Analog Sensors	KTY83-110, KTY84, PT1000
Max. cable length	For some types ≤ 1m
	The manufacturer's instructions must be followed

5.7 Fieldbus interfaces

The servo amplifier features either a CAN port, or an EtherCAT® port. Detailed information can be seen from the model code number.

CAN port X18 / X19:	
Port type	RJ45 female connector with LED
Network topology	Line terminated at both ends
Connectors	Galvanically isolated
Connecting cable	CAT5 Ethernet cable
Max. cable length	30 m (depending on the bit rate)
Bit rate	1 Mbit/s
Communications profile	CANopen DS301 with application profile DSP402

EtherCAT port X18/X19:	
Port type	RJ45 female connector with LED
Network topology	No restrictions (e.g. line, ring)
Connecting cable	CAT5e STP or FTP Ethernet cable
Max. cable length	100 m between two nodes

6 Mechanical installation

This servo amplifier has been designed for being installed in a control cabinet. Die Schutzart ist IP20. The specified ambient conditions during operation must be complied with.

The servo amplifier must be fastened to a metal mounting panel in vertical direction with the power and motor connector X1 pointing downwards. Its rear panel must have full contact with the mounting panel.

- ✓ Prior to installing the servo amplifier, check it for transport damages.
- ✓ The mounting plate in the control cabinet must not be coated.
- ✓ Make sure that the clearance around the device meets the specification.

1. Drill the mounting holes.
2. Screw the fastening bolts into the mounting panel by half of their length.
3. By means of the keyholes in the rear panel, hang up servo amplifier by the fastening screws.
4. Screw the lower screw down tightly.
5. Screw the upper screw down tightly.

7 Electrical installation

7.1 General remarks

The user is responsible for ensuring that the installation of servo amplifier JM-100x, motor, and other devices complies with the safety instructions (e. g. DIN, VDE), as well as with all other relevant federal or local regulations as to dimensioning of conductors, protection, grounding, breakers, overcurrent protection, etc.

Only qualified personnel who have completed an electrotechnical education, and who are familiar with the documentation and the warnings and precautions given therein.

Damaged products must not be installed.

The allowed input voltage range of the servo amplifier must not be exceeded.

The rated voltage of the connected motors must be higher than, or at least equal to, the supply voltage (X1).

7.1.1 Electromagnetic compatibility

To avoid electromagnetic interferences, great attention must be paid to the installation and wiring of digital servo amplifiers. This is particularly true for ground potential connections and shieldings.

EMC can be split into two categories:

- Immunity to interference (interferences from external sources)
- Emitted interference (interferences emitted from the devices)

Root cause for emitting interferences

The output stage of the servo amplifier features a high-speed semiconductor switch triggered by pulse-width modulation. This is necessary to be able to generate a variable current and a variable frequency for motor control. The high clock rate and the steep voltage rise caused by the switching output stage result in unavoidable emitted interferences.

Emitted interferences strongly depend on the following factors:

- Installation location
- Wiring and installation
- Additional components (line filter, line reactor, ...)
- Combination of servo amplifiers for a machine or system

EMC requirements

Standards relevant to this device

This servo amplifier is a product which can be used in drive systems of category C2 (industrial environment) according to EN 61800-3.

EU standards and legislation

At EU level (in all member states of the European Union), standards are implemented into national laws. EMC regulations are governed by EU Directive 2014/30/EC.

7.2 Block diagram

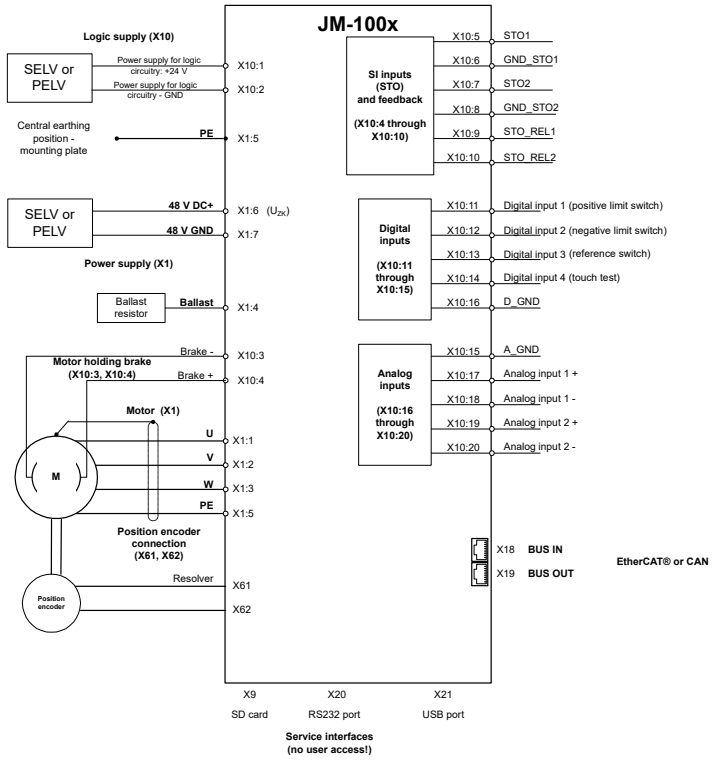


Fig. 5: Block diagram_JM-100X

7.3 Pin assignment of connections

7.3.1 Power and motor connector X1

PIN	Signal	Function
X1:1	U	Motor connection
X1:2	V	Motor connection
X1:3	W	Motor connection
X1:4	Ballast	Motor connection or ballast resistor to be connected between this PIN and GND 48 V.
X1:5	PE	Protective earth cable connection
X1:6	DC 48 V	Motor power supply independent of motor type
X1:7	GND 48 V	

PIN	Signal	Motor type		
		Servo motor	DC motor with brushes	LinMot
		BLDC		Low-rating linear motors
		3-phase stepper motor		2-phase stepper motor
X1:1	U	U	U+	U+
X1:2	V	V	U-	U-
X1:3	W	W	n. c.	V+
X1:4	Ballast	Ballast	Ballast	V-
X1:5	PE	Protective earth cable connection		
X1:6	DC 48 V	Power supply independent of motor type		
X1:7	GND 48 V			

7.3.2 I/O interface X10

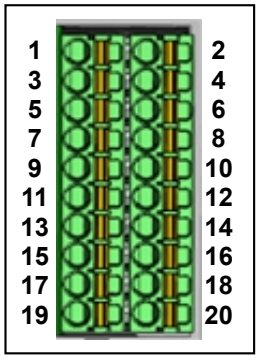


Fig. 6: X10 pinout

The I/O interface includes the following pins: Power supply for logic circuitry, motor holding brake, 2 SI inputs, 1 checkback contact, 4 digital 24 V inputs (not SI), and 2 analog inputs.

For more information on how to connect individual inputs or outputs refer to the connection diagram.

PIN	Assignment
X10:1	Power supply for logic circuitry +24 V
X10:2	Control voltage GND
X10:3	Motor holding brake -
X10:4	Motor holding brake+
X10:5	STO1
X10:6	GND_STO1
X10:7	STO2
X10:8	GND_STO2
X10:9	STO_REL1
X10:10	STO_REL2
X10:11	Digital input 1
X10:12	Digital input 2
X10:13	Digital input 3
X10:14	Digital input 4
X10:15	A_GND
X10:16	D_GND
X10:17	Analog input 1+
X10:18	Analog input 2+
X10:19	Analog input 1-
X10:20	Analog input 2-

Tab. 1: X10 pinout

7.3.3 Encoder X61/X62

Position encoders can be connected to X61 and X62.

A second encoder which is directly fitted to the mechanical system can be used to detect its position.

The following combinations are supported:

Motor encoder	2. Encoder
Resolver	No encoder
	Sine/cosine incremental encoder
	incremental encoder RS-422
	EnDat 2.2 (digital)
HIPERFACE DSL®	No encoder
	Sine/cosine incremental encoder
	incremental encoder RS-422
EnDat 2.2 (digital)	No encoder
	Sine/cosine incremental encoder
	incremental encoder RS-422
Sine/cosine incremental encoder	No encoder
incremental encoder RS-422	No encoder
LinMot	No encoder

X61

Supports the following devices:

- Resolver (not with option TD or TL)
- Motor temperature monitoring
- HIPERFACE DSL® (optional, only with option TD)
- LinMot (optional, only with option TL)

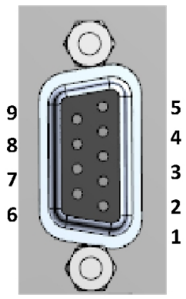


Fig. 7: X61 pinout

PIN	Signal
X61:1	R1 (exciter winding+)
X61:2	Sine+
X61:3	Cosine-
X61:4	TH+ motor temperature monitoring
X61:5	n. c.
X61:6	R2 (exciter winding-)
X61:7	Sine-
X61:8	Cosine+
X61:9	TH-motor temperature monitoring

Tab. 2: Resolver

PIN	Signal
X61:1	n. c.
X61:2	n. c.
X61:3	DSL+
X61:4	TH+ motor temperature monitoring
X61:5	n. c.
X61:6	n. c.
X61:7	n. c.
X61:8	DSL-
X61:9	TH-motor temperature monitoring

Tab. 3: HIPERFACE DSL®

PIN	Signal
X61:1	n. c.
X61:2	n. c.
X61:3	DC +5 V(encoder supply)
X61:4	Sensor sin (LinMot-specific)
X61:5	Motor temperature (LinMot-specific)
X61:6	n. c.
X61:7	n. c.
X61:8	GND (GND encoder supply)
X61:9	Sensor cos (LinMot-specific)
Housing	Shield

Tab. 4: TL (LinMot)

JetSym settings in Motion Setup for TL (LinMot)

► Make the following servo amplifier settings in Motion Setup under **Drive/motor** and **Drive/encoder**:

Motion Setup	Value
Drive/Encoder/Encoder 1/Encoder type	LinMot
Drive/Encoder/Encoder 1/Encoder resolution	65536
Drive/Motor/Motor design	Controlled 2-phase stepper motor
Drive/Motor/Motor temperature sensor	Motor-specific

X62

X62 can be used to connect a SinCos encoder or an incremental encoder. JetSym does not support the Hall and EnDat digital encoder types for JM-100x.

1. For absolute encoders, please use the TD option (HIPERFACE DSL® 2-wire, Jetter motors with F17 and F18 encoders).
2. For pinout refer to the X61 connector instead of resolver.

JetSym supports the TL option. Analog input for T6 option only.

► For the given pinout incl. TL option (LinMot) refer to tables 1 to 4.

- Each JetMove 100x features an X62 connector.
- For the basic version, the resolver is on X61.
- For the TD and TL options, the resolver is not set up on X61.
- Currently, JetSym does not support encoder types **EnDat digital** and **Hall (x1)**.

PIN	Sin/Cos	Incremental RS-422	Hall (x1)	EnDat digital (x1)	Comment
X62:1	DC +5 V				Encoder supply
X62:2	GND or A_GND				GND or A-GND AA1 (T6)
X62:3	n. c.	n. c.	n. c.	n. c.	
X62:4	N.C / AA1	n. c.	n. c.	Data+	AA1 analog output (T6)
X62:5	SIN+	A+	n. c.	n. c.	
X62:6	SIN-	A-	n. c.	n. c.	
X62:7	COS+	B+	n. c.	n. c.	
X62:8	COS-	B-	n. c.	n. c.	
X62:9	Ref+	C+ (Z+)	n. c.	n. c.	Reference/ zero pulse
X62:10	Ref-	C- (Z-)	n. c.	n. c.	Reference/ zero pulse
X62:11	n. c.	n. c.	Hall_U	Data-	
X62:12	n. c.	n. c.	Hall_V	Clock+	
X62:13	n. c.	n. c.	Hall_W	Clock-	
X62:14	TH+				Engine temperature monitoring
X62:15	TH-				Engine temperature monitoring
Housing	Shield				

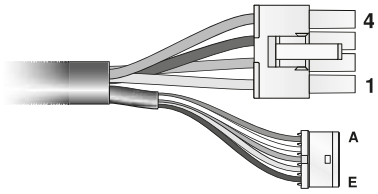
Tab. 5: X62 pinout

7.3.4 LinMot

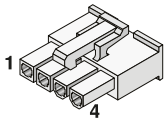
Motor Cable PRELIMINARY LinMot®



N-Connector	Motor Connector Wiring		
	Power Connector		
	Pin 4	red	Phase 1+
	Pin 3	pink	Phase 1-
	Pin 2	blue	Phase 2+
	Pin 1	grey	Phase 2-
	Signal Connector		
	Pin A	white	+5V
	Pin B	inner Shield	Ground
	Pin C	yellow	Sensor Sin
	Pin D	green	Sensor Cos
	Pin E	black	Temp sensor
	case	outerShield	shield



N/f





Ordering Information

High Flex Motor Cable directly to the Drive		
Item	Description	Part Number
KS05-W/N-2	High Flex cable W/N, 2m	0150-2296
KS05-W/N-4	High Flex cable W/N, 4m	0150-2297
KS05-W/N-6	High Flex cable W/N, 6m	0150-2298
KS05-W/N-8	High Flex cable W/N, 8m	0150-2299
KS05-W/N-	High Flex cable W/N. Custom Length	0150-3412

Connectors & Cable		
KS05-04/05	High Flex cable per m	0150-1938
KR05-W/R-	Robot cable W/R, per m	0150-3406
MC01-N/f	N/f connector	0150-3407
MC01-N/f-as	N/f connector, assembled	0150-3408

Fig. 8: LinMot PS02 motor cable

1. When using a LinMot PS02 short stroke motor cable with 4-pin power connector, the wire colors of this cable connect to X1, pins 1 ... 4 of the JM-100x with TL option.
2. To connect the encoder signals from this cable, use the TL option pinout on X61 on the JM-100x-S1 with TL option.

When using a PS01 series motor cable, the motor pinout is as follows:

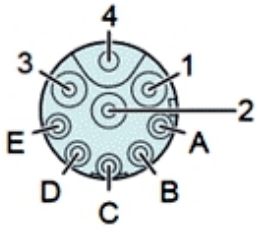


Fig. 9: 9-pin male connector

Motor pinout	PS01-23x80F-HP-R PS01-23x80F-HP-R20 R-connector	Motor cable wire color
Ph 1+	1	Red
Ph 1-	2	Pink
Ph 2+	3	Blue
Ph 2-	4	Gray
DC +5 V	A	White
GND	B	Inner shield
Sine	C	Yellow
Cosine	D	Green
Temp.	E	Black
Shield	Housing	Outer shield

Tab. 6: Motor pinout

Motor connection

JM-100x X1	Signal	Servo motor/ BLDC/3-phase stepper motor	DC motor with brushes	2-phase stepper motor, small linear motors	LinMot designation	LinMot wire colors, PS02 (short stroke), 4-pin male connector	LinMot PS01, 9-pin Intercontec with encoder on pins A ... E
X1:1	U	U	U+	U+	Phase 1+	Red	1
X1:2	V	V	U-	U-	Phase 1-	Pink	2
X1:3	W	W	n. c.	V+	Phase 2+	Blue	3
X1:4	Ballast	Ballast		V-	Phase 2-	Gray	4
X1:5	PE	Protective earth cable connection					
Control cabinet	Shield	Motor cable shield					Housing
X1:6	DC 48 V	Voltage supply independent of motor type					
X1:7	GND 48 V						

Tab. 7: Motor connection incl. LinMot PS02 and PS01

7.3.5 Fieldbus interfaces X18 / X19

The servo amplifier features either a CAN port, or an EtherCAT port. Detailed information can be seen from the type key.

Fieldbus interface

As fieldbus interfaces, 2 RJ45 ports are available.
Connector X18, BUS IN, is the CAN input.
Connector X19, BUS OUT, lets you connect further fieldbus nodes.

The status LED is for diagnostics.

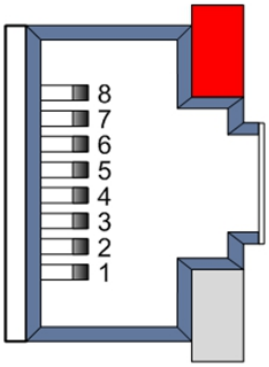


Fig. 10: X18
BUS IN

Setting the drive address via address selector S1

Address selector S1 is used to configure the drive address. The address range is from 1 to 15. Drive address “0” must not be set.

PIN	Signal	Pin	Signal
X18/19:1	CAN_H	X18/19:2	CAN_L
X18/19:3	CAN_GND	X18/19:4	n. c.
X18/19:5	n. c.	X18/19:6	n. c.
X18/19:7	CAN_GND	X18/19:8	n. c.

Terminating resistor

The first and the last device on the CAN bus must be equipped with a terminating resistor of 120 ohms. To enable the terminating resistors, set S2:4 accordingly.

Commissioning

To commission the interface, proceed as follows:

- Connect the CAN master or a CAN node having connection to a CAN master to X18.
- Enable the terminating resistor or connect additional CAN devices to X19.
- Check the CAN status LED.

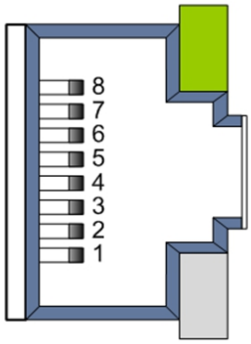


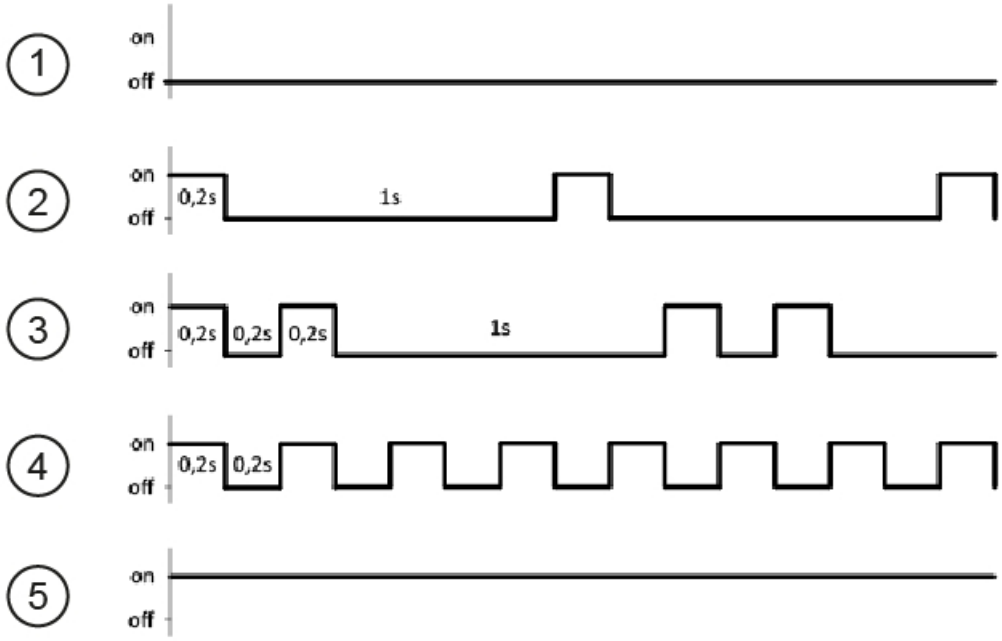
Fig. 11: X19
BUS OUT

CAN status LED

2 LEDs show the bus status.

Red: BUS ERROR
Green: BUS RUN

The following illustration shows their flashing code.



LED BUS RUN

Pos.	Signal	Description
1	OFF	Bus node state is **STOPPED** Communication with SDO or PDO is not possible
2	Blinks once	Bus node state is **STOPPED** Communication with SDO or PDO is not possible
4	Flashing at regular intervals	Bus node state is **PRE-OPERATIONAL** The node has not been activated yet Communication is possible only via SDO
5	Steady	Bus node state is **OPERATIONAL** Communication is possible via PDO, and SDO.

LED BUS ERROR

Pos.	Signal	Description
1	OFF	No error occurred.
2	Blinks once	**Overflow** in bus interface. Too many frames on the bus. Possible cause of this error: Missing terminating resistor, incorrect shielding/cable length, or bus load too high.
3	Blinks twice	**Guarding or heartbeat error.** Guarding or heartbeat telegrams ceased to arrive. The bus node state is **PRE-OPERATIONAL.** The servo amplifier responds to this error.
4	Flashing at regular intervals	Configuration error. PDO string too long or too short.

DIP switch

The device is delivered with all switches OFF. The DIP switch lets you enable/ disable the functions listed below.

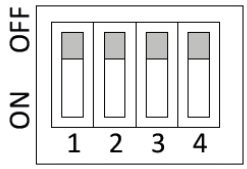


Fig. 12: DIP switch

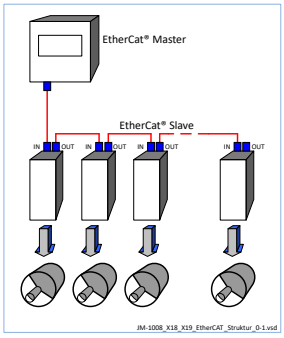
No.	Position	Function
S 2:1	OFF	no function
	ON	no function
S 2:2	OFF	no function
	ON	no function
S 2:3	OFF	no function
	ON	no function
S 2:4	OFF	CAN bus terminating resistor disabled
	ON	CAN bus terminating resistor (120 ohms) enabled

EtherCAT® ports X18 / X19

2 RJ45 ports allow for connection to the EtherCAT® bus. X18 is the EtherCAT® input, X19 connects to other EtherCAT devices® (slaves).

Pinout

PIN		Signal	Pin		Signal
IN	OUT		IN	OUT	
X18:1	X19:1	TxP	X18:2	X19:2	TxN
X18:3	X19:3	RxP	X18:4	X19:4	n. c.
X18:5	X19:5	n. c.	X18:6	X19:6	RxN
X18:7	X19:7	n. c.	X18:8	X19:8	n. c.



Commissioning

1. Connect the EtherCAT® master to the RJ45 X18 port.
2. Connect EtherCAT® slaves to the RJ45 X19 port.
3. Check the LED LINK.

LED LINK IN/OUT

OFF: No connection to the EtherCAT® strand.

ON: EtherCAT® device connected

Flashing: Communication with EtherCAT® device is active

7.4 Service interfaces

The service interfaces are not intended for users. They are reserved for Jetter-internal service purposes.

The service interfaces are listed below:

- RS-232 interface (X20)
- USB port (X21)
- SD card slot (X22)

7.5 LED indicators

Enabling visual diagnostics, the servo amplifier is equipped with 8 status LEDs located vertically to the left of the X10 I/O interface.

The LEDs are controlled by the microcontroller. Therefore, the indicated operating states depend on its firmware.

NOTICE! In the following illustration, the LEDs are arranged horizontally (rotated by 90° to the right) for reasons of space. The red error LED is located at the bottom of the device.

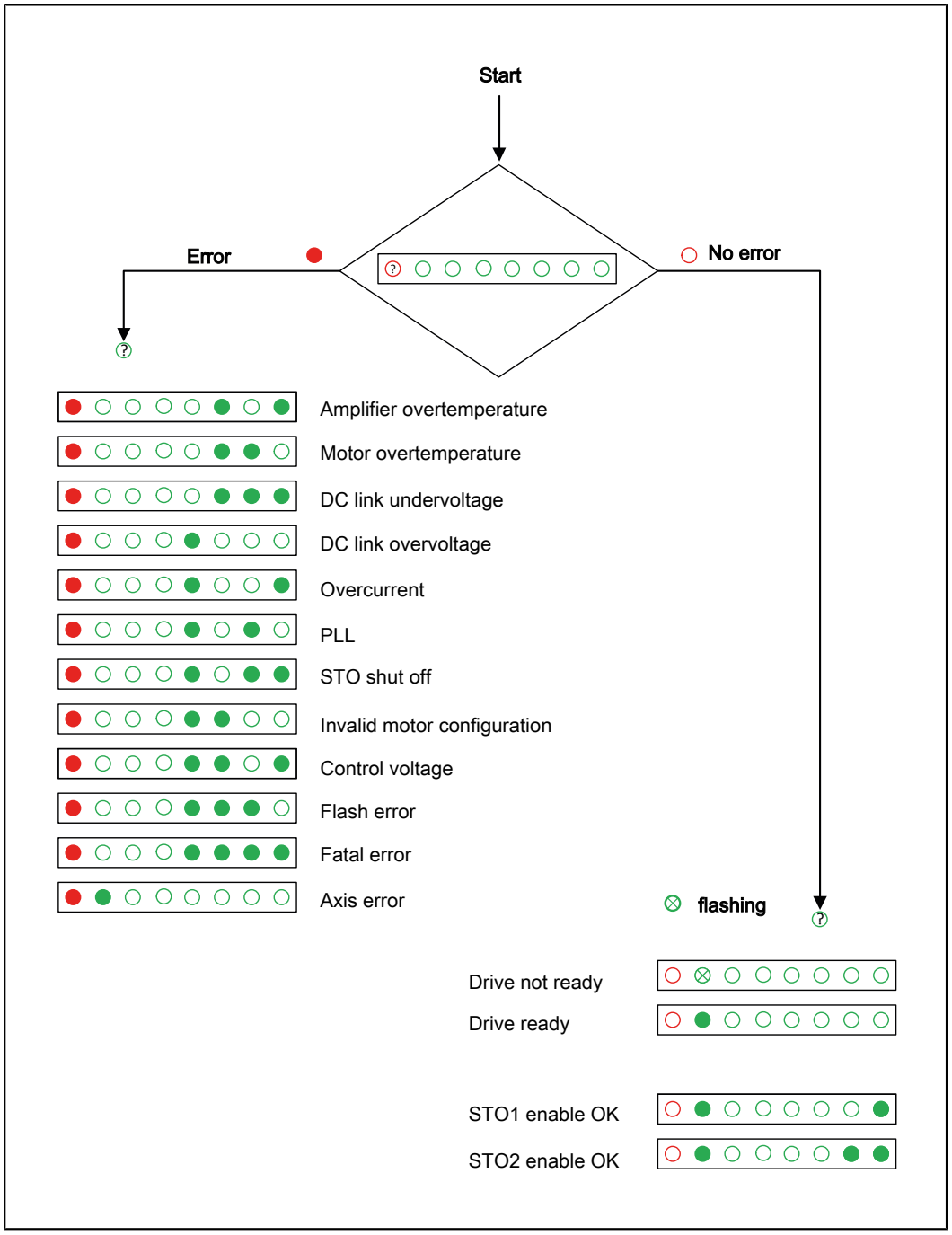


Fig. 13: Servo amplifier operating states

8 Maintenance and repairs

8.1 Maintenance

If the servo amplifier is used according to its intended conditions of use, it is maintenance-free.

8.2 Repairs

The servo amplifier must not be repaired by the operator.

If the servo amplifier is defective, replace the whole servo amplifier and contact your account manager.

8.3 Replacing the servo amplifier

1. Remove power from the servo amplifier.
2. Lockout the power supply.
3. Make sure that the servo amplifier is de-energized.
4. Remove all cables from the servo amplifier.
5. Remove the defective servo amplifier from the mounting plate.
6. Replace it by a new one with the same revision number or by a compatible device.
7. Wire the new servo amplifier as per instructions given in chapter “Electrical installation”.
8. Energize the servo amplifier.

Individual components of the servo amplifier must not be replaced or repaired. Only replacing the servo amplifier as a whole is permitted.

8.4 Return and disposal

How to dispose of waste equipment

Return your Jetter AG product to us for proper disposal. Visit our *homepage* for detailed information and to download the required Returns form.

Meaning of the WEEE icon



Fig. 14: WEEE icon – crossed-out trash can

Applicable local environmental directives and regulations must be complied with. The product is waste electronic equipment and must be disposed of by a certified waste management facility. Do not dispose of the product with normal household waste.

Personal data

Customers are responsible for deleting personal data from waste equipment prior to its disposal.

9 Service

9.1 Operating system

The OS is stored to the flash memory in the CPU. This memory cannot be accessed by the user. Important system files, such as firmware, images or EDS, are protected.

Jetter AG are continuously striving to enhance the operating systems of their products. Enhancing means adding new features, and upgrading existing functions.

There are several ways of updating an operating system:

- Via programming tool JetSym
- Via MicroSD card

ⓘ INFO

Further information

For more information on this subject, refer to the JetSym Online Help.

Current OS files are available for download on our homepage in the downloads area of the respective product.

ⓘ INFO

Further information

More information on this subject is available on our website.

Start | Jetter - We automate your success.

9.2 Customer service

Should you have any questions, suggestions, or problems, please don't hesitate to contact our service representatives. To contact them, please call our technical hotline or use the contact form on our homepage:

Technical hotline | Jetter - We automate your success.

You are also welcome to send an e-mail to our technical hotline:

hotline@jetter.de

Please supply the following information when contacting our technical hotline:

- Hardware revision and serial number
  For the hardware revision and serial number of your product, please refer to the nameplate.

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