Bosch-Norm

N51M M20
N56A 05M0020 (synonymous document number)

2022-11-23

General delivery instructions for machines, installations and production equipment (MAE)

Document part number:	4 497 010 554
Technical responsibility:	AK082
Replaces edition:	2021-04-16
Changes:	On page 1, "Valid for" updated in the table below; Chapter 2: chapter description changed, additional binding force for FKS-decisions and FKS-decisions for energy-efficient components removed; Chap. 4.1 "Occupational health and safety" updated: Integration REACH requirements, Editorial changes
Change information:	AEN 4497R31997 (internal document of the Bosch Group)

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Area of validity, binding force, freedom to disclosure	
Valid for	Bosch Group
Binding for	All locations of the Bosch Group within the EU
Binding due to	FKS-decision:2006-03-23, MCM-decision:2018-11-09
Recommended for	All locations of the Bosch Group outside the EU
Disclosure	No restrictions

This Bosch-Norm is binding for suppliers if it is part of the order.

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General information	
Series	N51M Machine tools, delivery instructions
Bosch-Norm standardization expert	snm1si C/TED (497)
Document language	en
Original language	de

Translation			
Release date	Source language	Target language	Editor
2022-11-23	de	en	C/TED (497)

In case of doubt, the original language edition of this Bosch-Norm applies.
The comma is used as the decimal marker.
Valid edition only in NormMaster. No change service for copies.

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1 Scope

This Bosch-Norm specifies the general delivery instructions for machines, installations and production equipment (MAE).

2 Binding force and applicable regulations

The Bosch-Norm **N51M M20** is binding for all machine types within the EU. The adoption of the **N51M M20** is recommended for all other regions. Country-specific legislations and regulations should be considered during the implementation.

Deviations from the **N51M M20** should basically be coordinated with the respective lead plant. The following standards and guidelines should be adhered to, **in case of external standards in the respective edition valid at the time of placing on the market, in case of Bosch-Norms in the edition on which the assignment was based:**

1. Ecodesign according to Regulation (EU) 2019/1781. Moreover, we prefer more energy-efficient MAE, which support the principle of sustainability of resources, at the same functionality.

2. Electric equipment as per DIN EN 60204-1:2019-06 and Bosch-Norms: N51M M23*N56A 05M0023, N54 B3*N56A 05002, N54 C1, N54 D2, N54 D4, N54 D6, N54 D8

3. Hydraulic and pneumatic equipment as single assemblies as well as part of machines, as per Bosch-Norm N51M M23*N56A 05M0023

4. IT-Security of machines, installations and production equipment (MAE) as per Bosch-Norm N51M M27

5. Basic safety and health requirements as per the **EG-Machinery Directive 2006/42/EG.**
   The functional safety of machines has to be carried out as per DIN EN ISO 13849-1:2016-06!

6. Requirements from **legal regulations** on work safety, fire and environmental protection
   - Independent adherence of instructions even during assembly works at our locations

7. Workplace design and dimensions according to ergonomic viewpoints as per N62A 3.3 (see Bosch GlobalNet C/TMP2)

8. Presentation of workplace with VDU as per N 2588 (binding only for Robert Bosch GmbH in Germany).

9. Open Source Software ("OSS") should be included in the MAE only as long as BOSCH has been informed in advance with the help of a complete and exclusive list of included OSS. The list has to contain the name and version number of the OSS components as well as an origin-URL and the name and version numbers of the respective applicable OSS licenses.
   The supplier has to completely adhere to all obligations, which are linked to OSS included in the MAE in any form (incl. e.g. OSS-licenses and copyright), and hand over all documents required for meeting the OSS license obligations to BOSCH.

The supplier is obliged to adhere to these instructions. Deviations from the Bosch-Norm have to be displayed in the offer and have to be documented latest while placing the order. The suppliers have to change deviations **that do not have our approval** for us **free of charge**.

The cooperation of the customer in the technical solution or the approval of design characteristics does not relieve the supplier of the sole responsibility for flawless function and do not restrict the assured properties in any way.

3 Use of Bosch products

Products of the Bosch Group have to be used as far as possible.

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4 Requirements for work safety, fire and environmental protection

4.1 Work safety

a. Hazards have to be minimized with the help of a risk assessment.

b. On demand, the supplier grants BOSCH insight into the risk assessment of the entire equipment (e.g., machine tool with integrated waste metal conveyor and fire protection system).

c. Mark with the "CE"-symbol and handover of the EG-declaration of conformity.

d. MAE have to correspond to the state of the art technology w.r.t. noise emissions. The emission sound pressure level should clearly fall short of a value of 80dB(A) for a single MAE.
These are considered paramount as far as country-specific regulations make higher demands to the MAE.

e. The supplier meets their obligation to inform to the customer according to article 33(1) of the REACH ordinance 1907/2006/EG.

f. The use of materials, mixtures or products with materials in the part of delivery as per appendix XIV of the REACH ordinance 1907/2006/EG, that has an obligation to approve, must be approved explicitly by the customer. On the contrary, the customer informs the supplier if they provide corresponding products or materials (e.g., for the functional test).

g. The use of materials, mixtures or products with materials in the part of delivery as per appendix XVII of the REACH ordinance 1907/2006/EG, that has a restriction, must be approved explicitly by the customer.

h. If materials, which fall in the area of validity of the **CLP-Ordinance**, (EG-Ordinance No. 1272/2008) or **Biocide-Ordinance** (EU-Ordinance No. 528/2012), are used for the operation and/or maintenance, then the orderer's approval is necessary.

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4.2 Fire and explosion protection

a. Equipment for avoiding or limiting explosions have to be established and tested technically.

b. Fire and explosion protection equipment have to be carried out as a result of a hazard assessment.

c. A construction list has to be written for fire protection equipment.

4.3 Environmental protection

a. MAE have to be formed and carried out in such a way that there is no hazard for human, air, soil and waters.

b. MAE have to be tight, stable and resistant to the mechanic, thermal and chemical effects that are to be expected.

c. Leakiness have to be quickly detectable; leaking materials have to be retained.

d. MAE with environment damaging materials have to be ordered above ground. Exception: double-walled container and pipes with monitoring.

e. MAE have to be marked w.r.t. the used materials and quantities.

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5 Securing all parameters

All process-, MAE- and component parameters have to be documented.

Examples:

- SPS and NC program / Project Software Parameter as well as external component parameterization
- Frequency transformer
- Pumps and other drives with integrated frequency transformers
- Parameterizable sensors
- Scanner-Settings
- Control units (e.g. thermostat, balancing regulator, ...)
- Printer, Label printer
- Measuring protocol of the afterrun time while using light curtains (BSV)
  (Proof of the current distance and definition of danger points)
- Other monitoring devices with parameter settings.

6 Coats of paint/Surfaces

The coats of the equipment has to be oil and gasoline-resistant as well as resistant against synthetic, water soluble (mineral oil free) coolants.

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7 Preliminary inspection and acceptance

The preliminary inspection is carried out in the manufacturing plant. Before the preliminary inspection, the agreed machine capability has to be documented with the minutes by the manufacturer together with the process data.

The complete delivery scope has to be proven during the preliminary inspection.

The final inspection basically takes place in our plant and includes:

- proof of the ensured functions and properties, as well as meeting of delivery instructions as per our order
- the safety inspection
- the electric initial review as per N54 C1
- the inspection of IT-Security as per N51M M27
- the software inspection as per N54 C4
- the static inspection as per ISO 230-1:2012-03 as far as applicable or according to the Bosch-booklets Quality management in der Bosch-Group Booklet 9 and 10
  (BGN → Organization → Corporate Headquarters and Service Areas → C/QM → Regulations & Standards → Bosch Booklets).

8 Transport instructions

Special instructions for transport and assembly have to be attached to the machine.
In case of individual machines, the net weight has to be mentioned on the type label. In case of MAE, which have to be taken apart for transport, each transport unit has to be labeled with its weight.

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9 Documentation

The documentation in electronic format is mandatory. Standards are neutral formats, e.g. PDF (exceptions, e.g. electronic documentation preferably in the EPLAN interchange format, see Table 1); format of the PDF as native, electronically editable and searchable PDF, analogous for other formats. Demand and scope of interchange formats have to be agreed upon with the customer (offer scope), likewise the documentation in paper format.
The filing structure according to folders 1-7 applies for electronic data carriers as well as for the paper format.
The documentation has to be delivered according to Table 1, with exception of documents marked with *, as per **EG-Machinery Directive 2006/42/EG**, in the official language (or one of the official languages) of the country of use, in which the machine is put on the market and/or put into operation. The documents marked with * should be delivered only in German or English and/or in agreement with the customer in the official language (or one of the official languages) of the country of use.

Documents in paper format:

- Folder with spine labels with summary
- filed, if required, folded in DIN A4
- Subdivision of individual chapters with labeled separators (labeling according to the chapters).

After placing the order, the following documents have to be **provided in time for approval** (shipment address in the order):

- Installation plan with specifications through consumption data (e.g. current, gas, water, air), if required, foundation plan
- Circuit diagram incl. Bill of Material
- Drawings of workpiece-related equipment (e.g. of clamping devices, loaders and unloaders, special tools and interchange parts).

Further documents of the operator according to the following table have **to be delivered** to the shipping address **together with the MAE**:

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Table 1 Documentation

Folder no./Title	Subfolder no./Title	Documents
Folder 1 Operating instruction	1. Safety measures	• Intended use • Safety device of the machine • Protective measures for the operators • Duties of the operator • Residual risk • Operating and working instructions • Hydraulic equipment • Notes on hazardous materials
	2. Transport, Assembly, Connection, Disassembly	• Delivery • Transport • Assembly and connection • Notes on disassembly of the machine • Storage and preservation • Notes on liability • Disassembly and assembly of aggregates • Dimensions and weights
	3. Description of the machine	• Function description Mechanical • Station description • Assembly overview incl. documents of incomplete MAE (e.g. delivery assembly) • Technical data
	4. Operation of the machine	• Operating instructions • Start-up • Operating modes • Control panel/Operator panel
	5. Behavior in case of disturbances	• Hotline-/Service number of the installation supplier • Procedure for removing disturbances • Description of error messages in plain text • Work instruction for component exchange
	6. Modification, Calibration, Teach-in	• Modification • Calibration • Teaching instructions
	7. Appendix	• CE-declaration of conformity • Declaration of incorporation • Assembly instructions* • Safety Data Sheet* • Delivery scope documentation*

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Folder no./Title	Subfolder no./Title	Documents
Folder 2 maintenance		• Documents and notes on maintenance incl. all additionally bought devices mechanical and electrical • Operating and working instructions • Maintenance plan according to qualification level (if possible, with estimated time effort) see document TPM column 4 • Spare parts ordering notes • List of spare parts, wear parts, tools under specification of the original manufacturer description and number* with minimum requirements as per the table in the appendix for EVW list (differentiation between mechanical/electrical)*, Template for EVW list, see attachment 1 (Excel chart)
Folder 3 Bills of Material mechanical		• In the mechanical bills of material, externally procured and standard parts should be identifiable under the specification of the original manufacturer description and number* • All bills of material (incl. standard assemblies, calibration parts, interchange parts)* with notes, whether restorable
Folder 4 Drawings - mechanical		• All assembly drawings incl. standard assemblies* • Wear part, tool and/or workpiece-related drawings, Test equipment drawings* with notation on agreed rights of use • Pneumatic- and hydraulic schemata preferably in BR-Interactive Fluidic Office, Cooling-Lubricant plans and Schemata*
Folder 5 Catalog parts - mechanical/electrical (additionally bought devices)		• Alphabetically sorted according to supplier • Technical documents* • Operating instructions*
Folder 6 Electronic documentation	1. Hardware	• Electronic documentation in E-CAD, preferably in the EPLAN-interchange format (e.g., ZW1, see Bosch-Norm N54 D6) and 1x as paper print out* and searchable and editable PDF • Circuit diagram and bills of material (structured as per original manufacturer description and number) on CD/DVD, after discussion across the network* • Structured listing of all IT hardware components in PDF format (see N51M M27, IT-Security questionnaire, inventory)*

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Folder no./Title	Subfolder no./Title	Documents
	2. Software	• SPS-Application program* • Sequence chart (function chart, function diagram, function description or CTS)* • NC- or other additional programs* • Detailed parameter sets/lists according to chapter 6 (e.g. pressure sensors, sensor, etc.) and programs of intelligent devices incl. potential necessary software, Recovery-CD* and licenses • Image operating system, PC controller with description for its recovery (status end of machine implementation)* • Structured listing in PDF format of all software versions required for functionality (service) (see N51M M27, IT-Security questionnaire, Inventory)* • Provision of all data, incl. passwords, required for functionality (service) on CD/DVD, after discussion across the network*
	3. Network	• Determination of the network connection (e.g. IP-addresses), if applicable (see N51M M27, IT-Security questionnaire, Inventory)*
	4. Test technique	• Test technique*
Folder 7 Inspection documents and certificates		• Inspection documents and/or test books for monitoring-obligatory equipment (e.g. pressure vessel)* • Inspection reports of safety components* • Inspection report as per DIN EN 60204-1:2019-06* • BUS-inspection reports (e.g. ProfiBus-DP, ETHERNET)* • Inspection documents/inspection certificates of catalog parts* • Calibration reports (assemblies, manufacturing parts)* • Other documents (e.g. acceptance papers, machine capability, risk assessment)*

Changes in the MAE should be **supplemented in the documentation and transmitted** after agreement, however latest **6 weeks** after final inspection.

10 Publications

Our written approval has to be collected before publishing about machines and installations built (or being built) by us.

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11 Normative references

The following documents are necessary for using this Bosch-Norm. With dated references, solely the edition referred to applies. With undated references, the last edition of the indicated document applies (including all revisions). Intentionally cited historical documents are additionally identified as "H" in the column "Type."

No.	Document number (edition date)	Title	Type
1	N51M M20 Attachment 1	EVW-List (Excel sheet)	M
2	N51M M23*N56A 05M0023	Machine tools, delivery instructions; Delivery instructions for the electrical, pneumatic and hydraulic equipment of machines, installations and production equipment (MAE)	M
3	N51M M27	Machine tools, delivery instructions, General delivery instructions for IT-Security of machinery, installations and production equipment (MAE)	M
4	N54 B3*N56A 05002	Control engineering, electric-electronic; Hardware components for control engineering	M
5	N54 C1	Control engineering, electric-electronics; Initial acceptance of the stationary machines (MAE)	M
6	N54 C4	Control engineering, electric-electronics; Software acceptance of machines and equipment	M
7	N54 D2	Control engineering, electrical system - electronics; Electrical outfitting of machines, facilities and production equipment; Safety functions	M
8	N54 D4	Control engineering, electric-electronic; Bus systems	M
9	N54 D6	Control engineering, electric-electronic; E-CAD; Rules for design and designation	M
10	N54 D8	Good Practices »RSA-Integration«. Integration of installations and lines to the Bosch remote maintenance platform RSA	M
11	N62A 3.3	Work system design; Planning basics; Ergonomic basics, documents, forms	M
12	N 2588	Assessment of workplaces with Visual Display Units	M
13	DIN EN 60204-1:2019-06	Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2016, modified); German version EN 60204-1:2018	Z
14	DIN EN ISO 13849-1:2016-06	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015); German version EN ISO 13849-1:2015	Z
15	ISO 230-1:2012-03	Test code for machine tools - Part 1: Geometric accuracy of machines operating under no-load or quasi-static conditions	Z, H
16	EGV 1907/2006	Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)	Z
17	EGV 1272/2008	CLP-Ordinance (**C**lassification, **L**abelling and **P**ackaging)	Z
18	Ordinance EU 528/2012	Making available on the market and use of biocidal products	Z
19	**2006/42/EG**	EG-Machinery directive	Z
20		Bosch-Booklets Quality management in the Bosch Group Booklet 9 and 10	M
21	Ordinance (EU) 2019/1781	Laying down ecodesign requirements for electric motors and variable speed drives	Z

Type M = document to be supplied; Z = cited document; H = historical document

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A Appendix: Minimum requirements EVW list

Table 2 Minimum requirements EVW list

No.	Column	Comment/Exemplary values
1	Item	Serial number
2	Sum of usages	Total quantity per machine/line
3	Recommended quantity	Quantity as per MAE supplier recommendation (0 is permissible!)
4	Designation	Naming of the component (e.g. valve)
5	Original manufacturer (OEM)	Manufacturer name/Brand
6	Order no. (OEM)	Type or number of part at OEM that can be ordered
7	Type code (OEM)	Further technical information
8	Category	E = Spare part; V = Wear part; W = Tool / Interchange parts; P = Test equipment (V and W Right to use BOSCH obligation)
9	Service life	Service life in wear parts (V) and tools (W) according to estimate by manufacturer
10	Right to use (for Bosch designed)	OEM = Right to use Component manufacturer MAE = Right to use with the MAE supplier (contractor) Bosch = Right to use with customer
11	(Spare part-) Availability	H = stocked 24h; K = if needed, in-house manufacturing/commission with delivery time
12	Restocking time	Indication of AT delivery time

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