

TERMS OF DELIVERY FOR HYDRAULICS AND PNEUMATICS

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I. PURPOSE

This document establishes a binding procedure for purchasing and accepting hydraulic and pneumatic components and equipment in the company ŠMT a.s. (hereinafter ŠMT)

II. ACTIVITY DESCRIPTION

1. General Principles

1.1 Scope of validity

These delivery conditions apply to sub-assemblies such as power units, power supplies and control panels supplied externally. Additions to or modification of these conditions is possible under the Technical ordering conditions or other annexes.

Any deviations from these conditions must be approved in advance and confirmed in writing by the Mechanical design dpt.

1.2 Acceptance

Provisional acceptance is performed within the scope specified by the "Acceptance Protocol". The location of provisional acceptance is determined by an agreement between ŠMT and the supplier.

Final, valid acceptance of equipment is performed in ŠMT after commissioning.

1.3 Regulations and directives, as amended

ISO 16019-1	Safety of machine tools - Machining centers, milling machines, process machines - Part 1: Safety requirements
ČSN EN ISO 23125	Machine tools - Safety - Lathes
ČSN EN ISO 12100	Safety of machinery - General principles for construction - Risk assessment and risk reduction
ČSN EN ISO 4413	Hydraulics - General rules and safety requirements for hydraulic systems and their components
ČSN EN ISO 4414	Pneumatics - General rules and safety requirements for pneumatic systems and their components
ČSN EN 60204-1 ed.3	Safety of machinery - Electrical equipment of machines - Part 1: General requirements

2. Technical parameters

2.1 Overload

The equipment must be fitted with elements that allow its overload by 10% and flow overload by 20%.

2.2 Flow rates

The maximum flow rate in the pipeline must not exceed the following values:

suction pipe 1m/s

drain pipe 3m/s

pressure pipe 5m/s

All elements (switchboards, valves) must be selected to match the nominal pipe diameter.

2.3 Oil temperature

The oil temperature in the tank must not exceed 55°C. The oil temperature must not exceed 70°C locally.

2.4 Work environment

Unless otherwise specified, the equipment is supplied for normal engineering environment for temperatures ranging from +5°C to +40°C.

2.5 Electrical equipment

Electrical equipment must be made in accordance with valid ŠMT delivery conditions (OBN_067 as amended) for electrical equipment.

2.6 Noise level

Noise level at a distance of 1 m from the hydraulic or electric drive contour, measured at a 1 m height, must not exceed 76 dB (A).

2.7 Coating

The standard paint colour, unless otherwise stated in the order, is RAL5015 HIMMELBLAU. Tank with internal protective coating.

3. Assembly and layout

3.1 Delivery of equipment

Hydraulic power units are supplied without filling. All connection points must be firmly sealed. Places subject to corrosion must be protected.

3.2 Elements

Individual elements of hydraulic equipment must be accessible for repair and easily replaceable. The control panels must be equipped with a drip tray to catch leaking fluid during replacement of individual elements.

If there are digital switches used in the equipment, they must be set up by the supplier. The values entered must be listed in the documentation to make replacement of the element possible.

3.3 Control units

In power unit and control panel extensions, longitudinal and vertical bonding systems with connection according to DIN 24340, shape A6, are preferred. Control measuring points with M16x2 thread.

3.4 Pipelines

Pipes must be easily accessible and installed so that the threaded connections used can be fitted with standard tools. Pipes must not prevent free handling of electrical equipment connectors.

3.5 Electrical equipment

Cable and connector terminals must not be pointing upwards. Cables must be placed so that they are not permanently lying in oil and are protected from mechanical damage.

The power unit (panel) must be equipped with a vertical auxiliary mounting surface for the terminal board to be screwed on. The body of the power unit (panel) must have an accessible earthing lug.

3.6 Tank

The tank must be designed with regard to easy cleaning and oil change. The placement of the pump intake and the minimum level indication must take into account the maximum utilization of the tank volume, i.e. at a minimum distance from the bottom of the tank. A drainage element (ball valve, plug – according to the spatial arrangement) must always be part of the tank.

3.7 Handling

The tank is equipped with suspension lugs for crane transportation. The location of the lugs is determined by the supplier with respect to stability during transport and protection of the individual elements from damage. Documentation must include a suspension lugs drawing, showing the suspension method, centre of gravity and total weight of the equipment.

3.8 Design and layout

The supplier is required to send each power unit, block or unit to ŠMT for approval (3D model in *.step format and drawing in *.pdf format) and to indicate in writing any differences to the Technical ordering conditions or their other annexes. The supplier is responsible for the proper operation of the power unit, block or unit.

4. Labelling

4.1 Elements

All mounting elements must be labelled with metal, corrosion-resistant plates with engraved black description and fixed using nails. Other method upon agreement with the SMT design dpt. The image of the function label must face the correct side in relation to the mounting element.

Labels must be placed on non-replaceable parts.

4.2 Pipelines

The hydraulic line outlets and the disconnectable connectors must be marked by sleeves in accordance with the respective diagram.

4.3 Labelling system

Labelling of the mounting elements must be in accordance with the documentation provided. All elements indicated in the hydraulic diagram must be labelled. Labels must be in the same language as the language of the required documentation.

5. Design of individual devices

5.1 Control elements

Control elements in electrical parts must be designed for the control voltage specified in the tender documents, as standard, for the DC voltage of 24V. Protection of these elements must be min. IP64.

Unless specified otherwise in the Technical documentation for ordering, control elements in electrical parts must be equipped with a complete device connector designed according to the EN175301-803 ed. 2 standard, A shape, version M with

one locking screw, 2(3) poles with a protective contact, or an M12 connector according to EN60947-5-2 ed.3 (5(4) poles, version for DC contactless switches, so called "coding A").

Devices equipped with the M12 connector must also be equipped with an indication of the connected voltage and the status of the built-in switch contact. Devices equipped with a different type of device connector must also be supplied with a counterpart to this connector. The solenoid connector counterparts must be equipped with an interference suppressor.

5.2 Regulating elements

The flow control valves must be pressure-compensated, unless otherwise specified in the hydraulic diagram.

5.3 Accumulators

Hydraulic accumulators subject to testing requirements in accordance with applicable laws and standards of the end-user country are supplied with a test certificate issued by the technical inspection body, in triplicate and the required language version.

To prevent unacceptable excess of pressure, the hydraulic accumulators must be equipped with safety valves checked during technical inspection. Documents related to this inspection must also be supplied in triplicate in the required language version.

The nameplate must contain all the information required by the laws and standards of the end-user country and must be clearly visible in the installed position.

5.4 Hoses

Safety factor 5 must be taken into account for pressure hoses. A hose must be mounted without twisting. The smallest bend radius specified by the manufacturer must not be exceeded.

5.5 Pipelines

All distribution, including threaded connections, must be resistant to air humidity.

5.6 Device design

All devices must be used in the original design without any additional modifications. Any, even slight, change is unacceptable.

6. Accessories

6.1 Accessories for pressure measurement

Part of the unit delivery (supply) is measuring tooling for measuring of pressure at the measuring points of the delivered equipment. The length of the connecting hose is 800 mm.

A pressure gauge with a diameter of 63 mm with glycerine filling. A scale in MPa with an indication range about 1/3 greater than the operating pressure range.

6.2 Accumulator charging device

It is necessary to supply the appropriate charging equipment to each accumulator. If there are more accumulators with the same filling valve on the unit, a delivery of one filling device will suffice.

6.3 Filter inserts

Each filter is supplied with 2 filter inserts of the same filter value. Each double filter is supplied with 4 filter inserts of the same filter value.

2 rolls of filter paper are supplied with the belt filter.

7. Technical documentation

The language version and number of paper copies according to the Technical documents for ordering (contract) and all technical documentation must always be supplied electronically (on a CD-ROM/FlashDisc) in *.pdf format.

The content and structure of the documentation must comply with the Machinery Directive 2006/42/EC and the requirements of the ČSN EN 60 204-1 standard.

The technical documentation must include:

- Instructions for Use,
- a hydraulic diagram including adjusted values and ŠMT labelling,
- electrical documentation according to the delivery terms for electrical equipment,
- a list of elements used (labelling according to ŠMT diagrams, number of pieces, name, type designation, manufacturer),
- layout arrangement
- suspension drawing
- data sheets of the main elements used in the language version required in the Technical documents,
- a pressure and functional testing protocol (setting protocol),

- EC Declaration of Conformity; Declaration of incorporation into an incomplete machine, Supplier's Declaration of Conformity in accordance with ISO/IEC 17050-1,
- annexes required by the Technical documents for ordering or under the laws of the country where the equipment is being delivered (Passport, Certificate of performance of the power unit according to the WHG Groundwater Protection Act, etc.).

III. ANNEXES AND RELATED DOCUMENTATION

Acceptance protocol

List of suppliers

Acceptance protocol of the block – panel – unit

Unit No.: 58	Contract No.:	Machine No.:
Supplier:	Designation type:	Order No.:

A. Technical design and parameters:	TI comments:
- tank design, equipment dimensions	
- oper. voltage and network frequency	
- colour	
- assembly and layout	
- inspection of elements used	
- labelling of elements	
- electrical equipment design	
- elements setting and connection control	
- noise	
- suspension lugs control	
B. Accessories:	
- tooling for pressure measurement	
- accumulator charging device	
- spare filter inserts	
- spare filter belt	
C. Technical documentation:	
- quantity	
- language version	
- completeness of documentation: <ul style="list-style-type: none"> • instructions for use • hydraulic diagram including adjusted values and ŠMT labelling, • electrical documentation according to the delivery terms for electrical equipment • list of elements used (labelling according to ŠMT diagrams, number of pieces, name, type designation, manufacturer), • layout arrangement • data sheets of the main elements used • a pressure and functional testing protocol (setting protocol), • EC Declaration of conformity • annexes required by the Technical documents for ordering or under the laws of the country where the equipment is being delivered (Passport, Certificate of performance of the power unit according to the WHG Groundwater Protection Act, etc.). • suspension drawing 	

Note: In case of nonconformity, add the necessary number of annexes with a detailed description.

Date:

Received by:

List of suppliers

If it is necessary, for technical reasons, to choose a supplier that is not included in the supplier list, a written approval by ŠMT (Mechanical design dpt.) is required.

If the technical documents for ordering do not include specifications of the element or manufacturer, then the supplier may choose from the following manufacturers' range of products:

Building element	Supplier
Hydraulic power units	Bosch Rexroth; Hydac; Hydrocom
Control units	Bosch Rexroth; Hydac; Hydrocom
Hydraulic units	Bosch Rexroth; Hydac; Hydrocom
Pneumatic panels	VSK Profi
Hydraulic pumps	Bosch Rexroth; Bucher Hydraulics; Hydac; Berarma
Valves	Bosch Rexroth; Bucher Hydraulics; Eaton Technologies - Vickers; Hydac
Pressure sensors	Bosch Rexroth; Bühler; Hydac; IFM; Suco
Level sensors	Bosch Rexroth; Bühler; Hydac; IFM; Woerner
Temperature sensors	Bosch Rexroth; Bühler; IFM
Flow sensors	IFM; Kobold; Meister Stroemungstechnik; Turck
Filters	Eaton Technology – Internormen; Hydac
Measuring connection	Ermeto - M16x2
Accumulators	EPE Italiana; Hydac
Lubricating equipment	Lincoln Industrial; Willy Vogel; Woerner
Pneumatic elements	Emerson – Rexroth Pneumatics
Pumps for cooling emulsions	Grundfos; Knoll
Valves for cooling emulsions	CO-AX Valves, RSG
Hoses	Argus – Dunlop Hiflex
Heat exchangers	Alfa Laval; Hydac; Olaer
Cooling devices	Pfannenberger; Rittal; Schimpke Haan; Habor