

Transport Installation Commissioning

INDEX MS16-6, MS16-6Plus
INDEX MS22-8
INDEX MS24-6
INDEX MS32-6
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Control System INDEX C200-sl

Note on applicability

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Safety Instructions

Instructions for shipment, installation, commissioning



When the working area door is open, the interlocking switch remains open after disconnecting the mains supply.



Shipping brackets are identified by their red color.

Improper shipment, installation or commissioning often leads to accidents, damage or malfunction of the machine which **INDEX** will accept no liability for and which will not be covered by the warranty.

Before the delivery, you should carefully plan the shipment to the installation site, the unloading, the installation and the commissioning of the machine. Please pay attention to the following instructions in this document.

For separate units e.g. chip conveyor, bar feeder, bar loading magazine etc., please see the corresponding shipping instructions.

General sources of danger during in-house transportation

Machines may be shipped only by authorized and qualified personnel.

Act consciously during shipping. Please omit hazardous and risky actions. Consider the consequences before acting.

Slopes and pitches can be particularly dangerous (e.g. ramps etc.). If passage is unavoidable extra precautions must be taken.

Make sure that the load will not slide off and that vehicle's traction and brake force are sufficient. Provide the load with additional securing devices, if necessary.

Dimensions and masses

For the masses of the machine and the control cabinet see the appropriate machine installation diagram in the chapter "Working data."

For the masses of separate units e.g. chip conveyor, bar feed, bar loading magazine etc. see the additional transportation instructions for these attachments or the appropriate machine installation diagram in the chapter "Working data".

Shipping- and lifting equipment

For lifting and moving individual units use only lifting and moving equipment with adequate load bearing capacity and loading area.

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Preparations

This chapter is addressed to all personnel in charge of the installation. On the basis of the following instructions, the installation site can be prepared for immediate installation and commissioning of the machine.

Make sure that the delivery, the unloading and the placement of the machine from the unloading location to the installation site are planned carefully.

Take into account the size (dimensions) and the masses of the individual units.

Suitable transport and lifting equipment must be provided on delivery of the machine.

Remove potential obstacles along the way from the unloading location to the installation site.

Inspect the route for load bearing capacity, evenness, damage to surface, ridges, gradients and slopes etc.

Is there sufficient clearance through gates and door ways?

Do elevators have sufficient load bearing capacity?

Good preparation pays off!

Suitable transport- and lifting equipment

- crane
- truck-mounted crane
- transport trolley
- transport rollers
- caterpillar rollers
- hydraulic jacks
- fork lifter, pallet truck (only for separate units; not suitable for machines).

Space requirements

Make sure to provide for the following:

- Sufficient clear space around the machine.
- Sufficient moving space for the operator.
- Sufficient space for maintenance and repair works.
- It must be possible to open all machine doors completely.
- Floor area must be provided for blanks- and workpiece palettes, workpiece container, chip pan, tool trolley etc.

See the machine installation diagram in the chapter "Working Data" for determining the space requirements.

Foundations

Special foundations are not necessary as long as the floor quality complies with the usual building regulations according to the weight of the machine.



- Comply with the requirements set out in **DIN 18202:2019**. In particular, note the information regarding **"Flatness tolerance for finished floors"**..
- Within the machine standing area there must not be expansion joints.
- The locally valid guide lines and regulations must be taken into consideration.

Fastening/anchoring

Doweling of the machine is not necessary.

Bar guides, bar feeders, and bar loading magazines must generally be anchored in the floor. (For instructions see the appropriate operating instructions and the machine installation diagram in the chapter "Working Data").

Environmental Conditions



If the data at the installation site deviate from the values above, please, contact INDEX or an INDEX agency.

Permissible ambient temperature +10° C to +40° C

Max. relative air humidity..... 50%

Max. height above sea level 1000 m above MSL

Power supply



Keep the cables for mains supply to the machine as short as possible. Cable cross section must be adequate.

Power supply for the adaptive control (PLC) and for the numeric control (NC) must be stable, i.e. the voltage fluctuation must not exceed $\pm 10\%$.

The cables must comply with the regulations of the local electricity suppliers and the locally valid regulations.

For additional data see chapter "Working Data".

Main fuse



Check if the service line can be loaded with an extra value that requires respective fusing. In case of doubt, have the situation clarified by the local electricity provider.

For exact electrical specification refer to the acknowledgement of order, please. The electrical documentation which is delivered together with the machine is decisive and binding. It must be available for the INDEX/TRAUUB service staff at any time.

Mains connection of the machine must happen via the main switch (multi-conductor cable). With connection, it is mandatory to heed the clockwise rotating field. The mains connection can be seen from the electric diagrams.

The machine has been prepared for connection to three-phase power supply (TN-network).

Before connection, please check, whether the existing power supply voltage corresponds with the operating voltage of the machine. Should this not be the case, a pre-transformer will be required.

For the values of:

- mains connection of the machine
- operating voltage
- main fuse

please refer to the type plate or to the wiring diagram of the machine.

External data transfer



Data lines must not run directly next to power lines.

When you intend to transmit data from/to an external computer or memory, appropriate metal ducts for the data lines must be installed.

Compressed Air Supply



Be aware of the max. permissible pressure for the machine. See pneumatic diagram in the chapter "Working Data".

Machines with elements operating with compressed air require compressed air supply with the following capacity:

For compressed air feed into the machine, see machine installation diagram in the chapter "Working Data".

Pressure accumulator

When the machine has been transported as airfreight all pressure accumulators fitted will be depressurized.

Before commissioning all pressure accumulators must be filled with nitrogen (N₂) by a specialist. Please keep to the recommended pressures.

For recommended pressures see the "Hydraulic diagrams" in the chapter "Working data".

Media to be provided

- Hydraulic oil ¹⁾
- Appr. 1 kg heavy duty grease for chucks
- Coolant

For required hydraulic oil and cooling lubricant types, please refer to document "Information on operation materials and substances".

For fill quantities, please see "Technical Data" in chapter "Design and functions of the machine".

¹⁾ Machine supplied with tank filled.

Pumps and Tanks

Change of hydraulic oil and coolant is part of regular maintenance.

For filling the hydraulic oil tank of the machine a pump with a 10 µm-microfilter (absolute) is required. The pump may be used only for this purpose.

For emptying the hydraulic oil tank and the coolant tank an ordinary pump is sufficient. The same pump can be used for filling the coolant tank, however, it has to be flushed with clean coolant beforehand.

The drained-off liquids are best collected in stable containers with adequate capacity. Best suitable are metal barrels which can be sealed and should be labelled.

Chip disposal

When the machine is equipped with a chip conveyor, a chip trolley to suitable for the discharge height of the chip conveyor is required.

The chip trolley should have a tap for draining-off the coolant trapped from the chips. This is environmentally beneficial and money saving.

Disposal of used media

Please ensure in time how used media such as hydraulic oil, lubricating oil and coolant can be disposed of in compliance with environment pollution regulations.

Compliance with waterbalance regulations

The machine contains water polluting liquids, such as water soluble coolants and mineral oils. These can leak out of the machine accidentally. Therefore the machine must be installed in a manner that no detrimental effects are possible to waters or ground water by these media.

Possible precautions:

- Placing the machine into a steel tray.
- Sealing the workshop floor.



The locally valid guide lines and regulations must be taken into consideration

Delivery

Machine

The machine is delivered by truck it is either on planks or packed in a box standing on a transportation platform.

Machine state on delivery:

- Hydraulic oil and lubricant oil tanks are filled.
- Coolant tank is empty. (The machine is equipped with a chip conveyor with integrated coolant tank. The chip conveyor is packed separately.)
- Certain moving parts of the machine e.g. sliding doors and pivoting operator's panel are secured by appropriate brackets.
- Overhanging parts that hamper the transportation are dismantled.
- All bright parts of the machine are coated with a rust preventive.

Other separate units

Certain attachments like chip conveyor, bar feeder, bar loading magazine etc. are generally packed separately

Chip conveyors are usually shipped on a platform.

Bar feeder and bar loading magazine are shipped in a separate box.

Loose parts, such as spanners, small tools and instruments etc. are packed in a separate cardboard box. This might be enclosed with one of the separate units.

Transportation equipment

The transportation equipment is either packed separately or enclosed with other units.

The transportation equipment is generally charged for. When returning it to INDEX after installation, a refund will be paid.



The transport hooks which are attached to the machine also form part of the transporting tackle.

First check the machine, the enclosed accessories and optional units for external damage and completeness (Bill of loading, delivery note).

Missing goods or damages can be confirmed on the note of delivery by the shipping company.

In case of damage it is recommended to take photographs for easier proof.

Please notify **INDEX** or **INDEX** agency.

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Transport of the machine



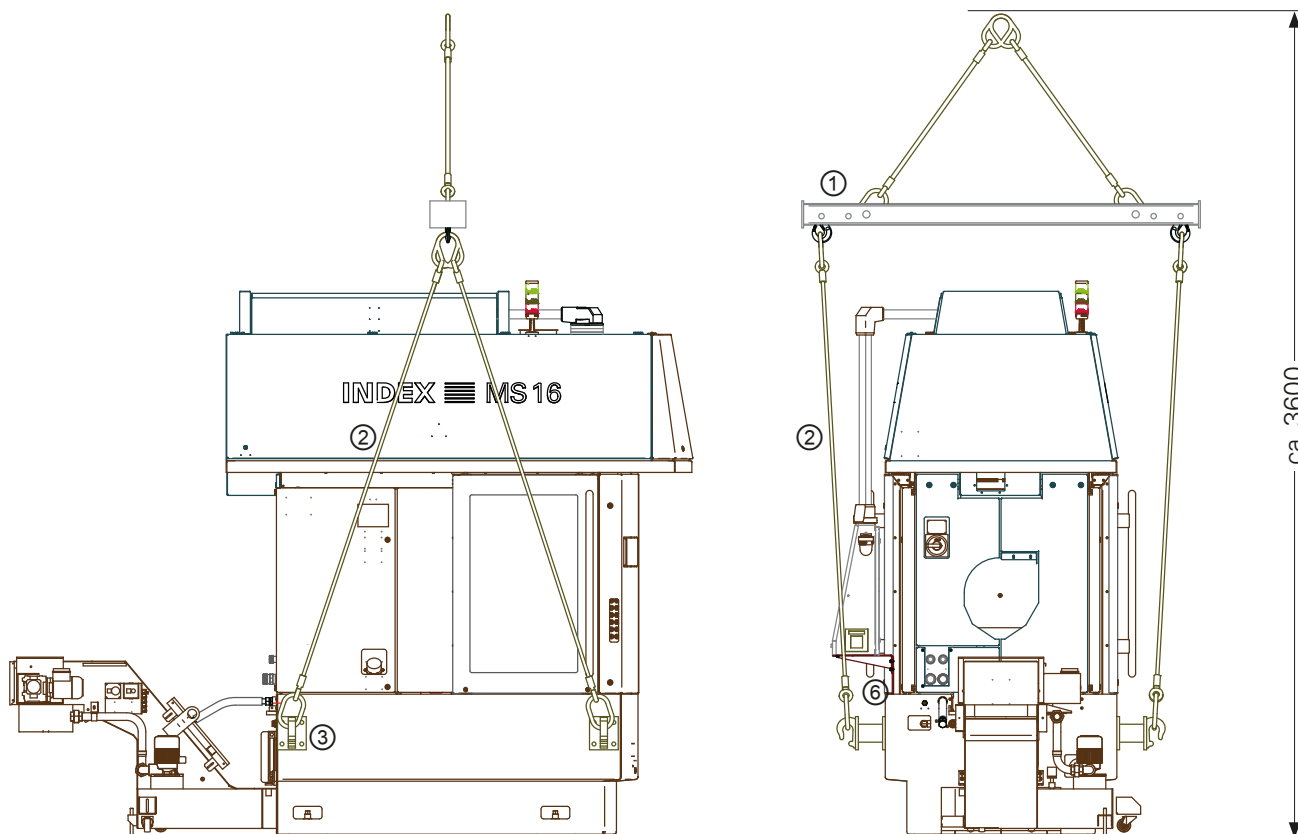
This machine is **not** suitable for transport by means of fork lift!

Mass of the machine with chip conveyor: approx. 5,200 kg

Transport by crane happens with screwed-on chip conveyor

Transport by crane – MS16-6, MS16-6 Plus

The traverse and slinging ropes required for appropriate transport of the machine will generally be supplied at extra cost and may be returned to the INDEX factory after setting up the machine. In case of a new transport of the machine, the above mentioned transporting tackle can be acquired liable to costs from the INDEX factory.



	Pos.	No. of	Description	Order number	
Transporting tackle	①	1	Spreader (transverse), complete - 6,5t	208 315.12	Total machine
	②	4	Slinging ropes steel - \varnothing 18 2350 mm (Carrying capacity minimum. 5t)	208 113.1828	
	③	4 16	Mounted hood with base - 4t + Cheese head screw M20x40 DIN 912-12.9	208 310.4613 410 260.2040	
Transportation safety device	⑥	1	Operating panel: red angle bracket	M90 991.80	Operating panel
		2	+ Cheese head screw M8x30 DIN 912-12.9	410 260.0612	
		2	+ black finished plate St 6,4	419 021.06	
		1	red ledger	M90 991.70	
		1	red holding plate	M90 991.60	
		4 4	+ black finished plate St 6,4 + Cheese head screw M6x16 DIN 912-12.9	419 021.06 410 260.0620	
Other transporting material		1	Plastic cover (4000 x 2200 x 2000 x 0,2)	398 572.1081	
		1	Anti-slip mat	288 000.0030	



The cheese head screws are meant for one-time use only.
The tightening torque of the screws can be seen from the respective screw standard.

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Transport of the machine

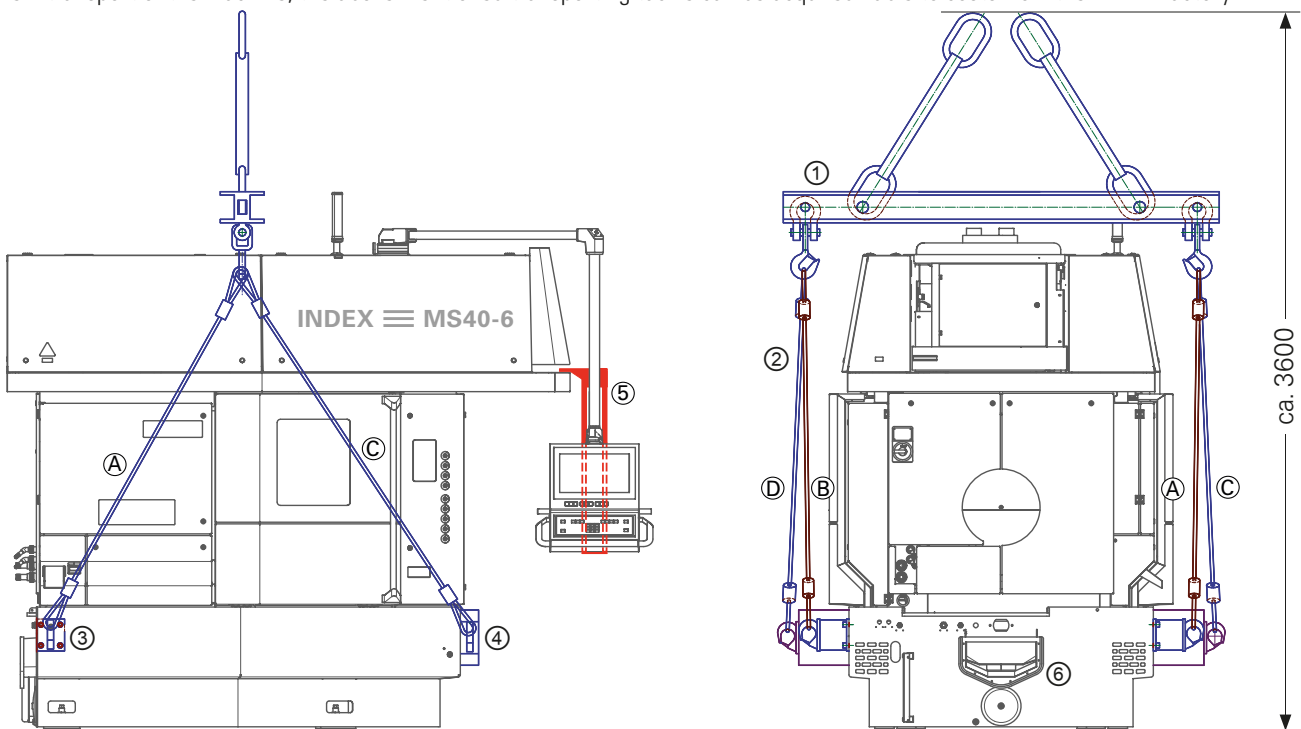


This machine is **not** suitable for transport by means of fork lift!

Weight of the machine approx. 7 100 kg

Transport by crane – MS22-8, MS32-6.2, MS40-6

The traverse and slinging ropes and the operating panel transportation safety device required for appropriate transport of the machine will generally be supplied at extra cost and may be returned to the INDEX factory after setting up the machine. In case of a new transport of the machine, the above mentioned transporting tackle can be acquired liable to costs from the INDEX factory.



	Pos.	No. of	Description	Order number SAP	
Transporting tackle	①	1	Spreader (transverse), complete - 13t	1018 7730	Total machine
	②	(4)	Slinging ropes steel - \varnothing 22		
		1	Pos. A 2430 mm (Carrying capacity minimum 5t)	1046 4780	
		1	Pos. B 2470 mm (Carrying capacity minimum 5t)	1064 7607	
	③	2	Pos. C / D 2730 mm (Carrying capacity minimum 5t)	1057 2230	
		2	Mounted hood with base - 4t	1008 0445	
④	8	+ Cheese head screw M20x40 DIN 912-12.9	(410 260.2040)		
	1	Front lead spreader - 6t	1105 9762		
Transportation safety device - machine	⑤	4	+ Cheese head screw M24x60 DIN 912-12.9	1005 5673	Base
	⑥	1	Operating panel transportation safety device	(GM21 01.9615)	
Other transporting material		1	Steel plate red (chip channel)	1049 5968	Base
		6	+ Cheese head screw M8x10 DIN 912-12.9	1026 4042	
		1	Plastic cover (4000 x 2200 x 2000 x 0,2)	1053 0655	
		1	Anti-slip mat (200 x 200 x 8)	1007 8426	



The cheese head screws are meant for **one-time use only**.
The tightening torque of the screws can be seen from the respective screw standard.

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Transport of the machine

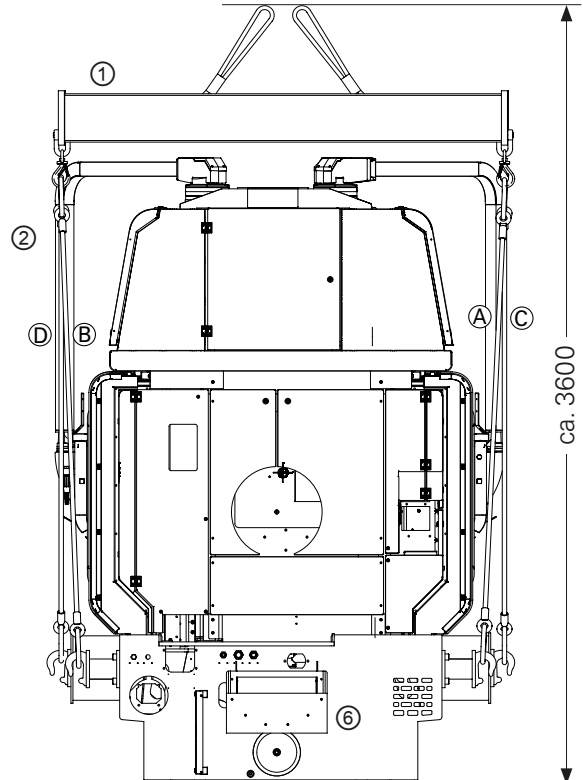
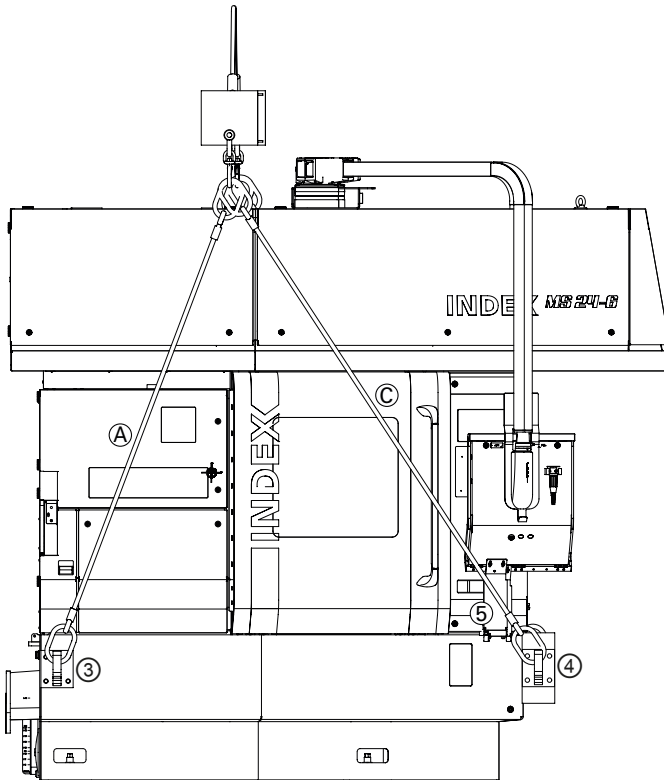


This machine is **not** suitable for transport by means of fork lift!

Weight of the machine
approx. 6600 kg

Transport by crane – MS24-6

The traverse and slinging ropes and the operating panel transportation safety device required for appropriate transport of the machine will generally be supplied at extra cost and may be returned to the INDEX factory after setting up the machine. In case of a new transport of the machine, the above mentioned transporting tackle can be acquired liable to costs from the INDEX factory.



	Pos.	No. of	Description	Order number SAP		
Transporting tackle	①	1	Load traverse (transverse), complete - 13t	1018 7730	Total machine	
	②	(4)	Slinging ropes steel - \varnothing 22			
		1	Pos. A	2430 mm (Carrying capacity minimum 5t)		1046 4780
		1	Pos. B	2470 mm (Carrying capacity minimum 5t)		1064 7607
		2	Pos. C/D	2730 mm (Carrying capacity minimum 5t)		1057 2230
	③	2	Mounted hood with base - 4t	1008 0445		
		8	+ Cheese head screw M20x40 DIN 912-12.9	1103 0816		
Transportation safety device - machine	④	1	Front lead spreader - 6t	1105 9762	Base	
		4	+ Cheese head screw M24x60 DIN 912-12.9	1005 5673		
	⑤	1	Transport locking device for operating panel front and rear side	1205 8006		
		1	Transport locking device for operating panel front side	1209 0038		
Other transporting material	⑥	1	Steel plate red (chip channel)	1049 5968		
		6	+ Cheese head screw M8x10 DIN 912-12.9	1026 4042		
			1	Plastic cover (4000 x 2200 x 2000 x 0,2)	1053 0655	
		1	Anti-slip mat	1007 8426		



The cheese head screws are meant for **one-time use only**.
The tightening torque of the screws can be seen from the respective screw standard.

INDEX MS32-6.3 Transport of the machine

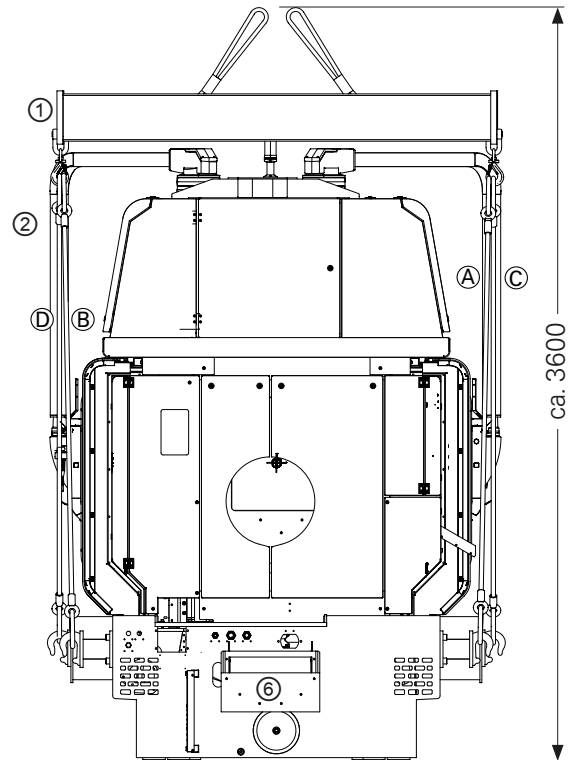
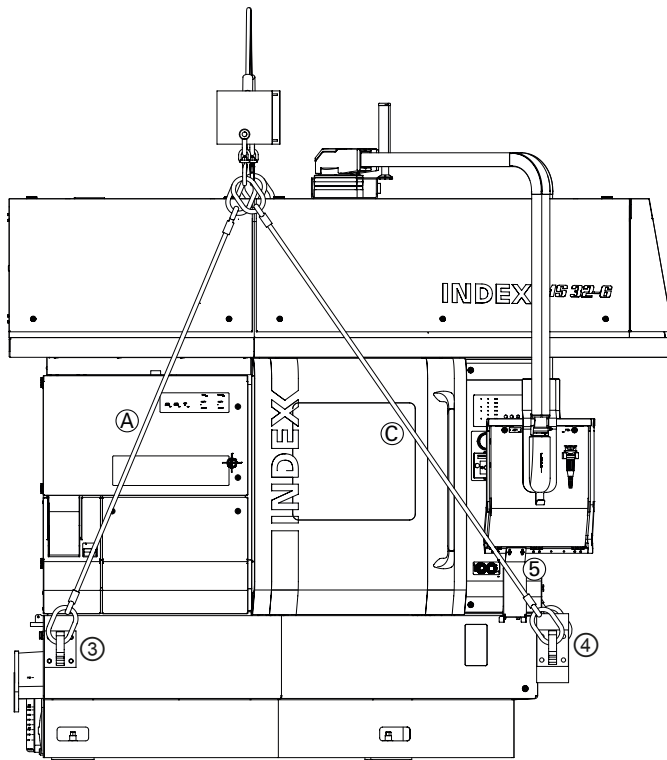


This machine is **not** suitable for transport by means of fork lift!

Weight of the machine approx. 7 100 kg

Transport by crane – MS32-6.3

The traverse and slinging ropes and the operating panel transportation safety device required for appropriate transport of the machine will generally be supplied at extra cost and may be returned to the INDEX factory after setting up the machine. In case of a new transport of the machine, the above mentioned transporting tackle can be acquired liable to costs from the INDEX factory.



	Pos.	No. of	Description	Order number SAP	
Transporting tackle	①	1	Load traverse (transverse), complete - 13t	1018 7730	Total machine
	②	(4)	Slinging ropes steel - \varnothing 22		
		1	Pos. (A) 2430 mm (Carrying capacity minimum 5t)	1046 4780	
		1	Pos. (B) 2470 mm (Carrying capacity minimum 5t)	1064 7607	
	③	2	Pos. (C)/(D) 2730 mm (Carrying capacity minimum 5t)	1057 2230	
		2	Mounted hood with base - 4t	1008 0445	
④	8	+ Cheese head screw M20x40 DIN 912-12.9	1103 0816		
	1	Front lead spreader - 6t	1105 9762		
Transportation safety device - machine	⑤	4	+ Cheese head screw M24x60 DIN 912-12.9	1005 5673	
		1	Transport locking device for operating panel front and rear side	1205 8006	
⑥	1	Transport locking device for operating panel front side	1205 8004	Base	
	1	Steel plate red (chip channel)	1049 5968		
Other transporting material		6	+ Cheese head screw M8x10 DIN 912-12.9	1026 4042	
		1	Plastic cover (4000 x 2200 x 2000 x 0,2)	1053 0655	
		1	Anti-slip mat	1007 8426	



The cheese head screws are meant for **one-time use only**.
The tightening torque of the screws can be seen from the respective screw standard.

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Transport of the machine

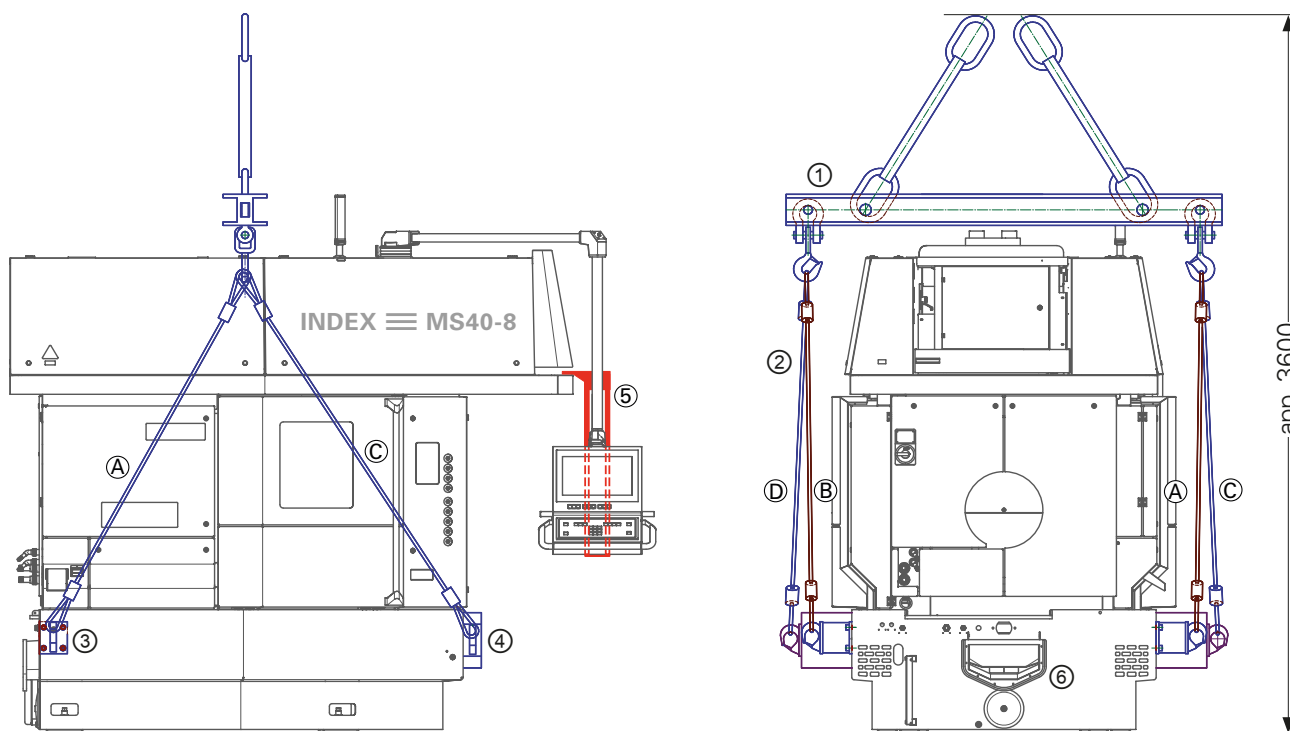


This machine is **not** suitable for transport by means of fork lift!

Weight of the machine
approx. 10 000 kg

Transport by crane – MS40-8

The traverse and slinging ropes required for appropriate transport of the machine will generally be supplied at extra cost and may be returned to the INDEX factory after setting up the machine. In case of a new transport of the machine, the above mentioned transporting tackle can be acquired liable to costs from the INDEX factory.



	Pos.	No. of	Description	Order number	
Transporting tackle	①	1	Spreader (transverse), complete - 13t	208 315.1455	Total machine
	②	(4)	Slinging ropes steel - \varnothing 22		
		1	Pos. A 2430 mm (Carrying capacity minimum. 5t)	208 113.2224	
		1	Pos. B 2470 mm (Carrying capacity minimum. 5t)	208 113.2225	
	③	2	Pos. C/D 2730 mm (Carrying capacity minimum. 5t)	208 113.2227	
		2	Mounted hood with base - 5t	208 310.4612	
④	8	+ Cheese head screw M20x40 DIN 912-12.9	410 260.2040		
	1	Front lead spreader - 6t	208 315.1456		
Transportation safety device	⑤	4	+ Cheese head screw M24x60 DIN 912-12.9	410 260.2460w	Base
		1	Transport locking device for operating panel	GM21 01.9615	
Other transporting material	⑥	1	Steel plate red (chip channel)	M32 802.70	
		6	+ Cheese head screw M8x10 DIN 912-12.9	410 260.0810	
		1	Plastic cover (4000 x 2200 x 2000 x 0,2)	398 572.1081	
		1	Anti-slip mat	288 000.0030	



The cheese head screws are meant for **one-time use only**.
The tightening torque of the screws can be seen from the respective screw standard.

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Transport of the machine

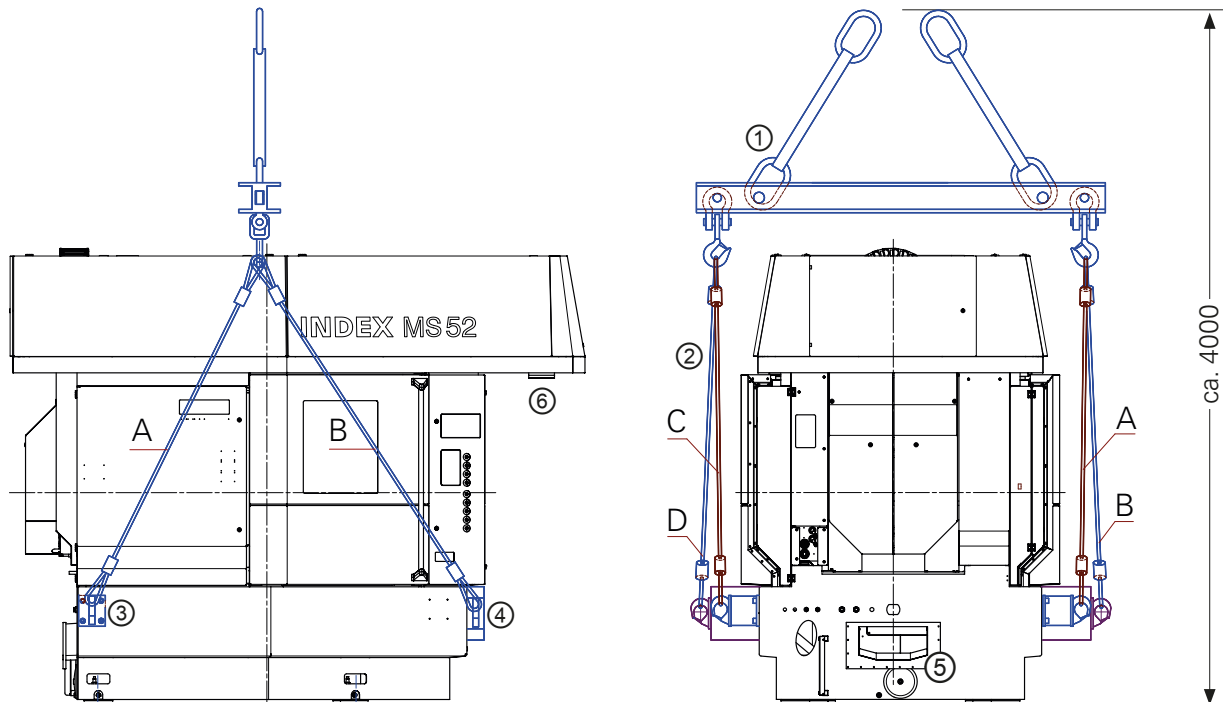


This machine is **not** suitable for transport by means of fork lift!

Weight of the machine approx. 12 000 kg

Transport by crane – MS52-6.3

The traverse and slinging ropes required for appropriate transport of the machine will generally be supplied at extra cost and may be returned to the INDEX factory after setting up the machine. In case of a new transport of the machine, the above mentioned transporting tackle can be acquired liable to costs from the INDEX factory.



	Pos.	No. of	Description	Order number	
Transporting tackle	①	1	Spreader (transverse), complete - 13t	208 315.1455	Total machine
	②	(2)	Slinging ropes steel - \varnothing 22	208 162.0003	
		1	{ Pos. A 2500 mm (Carrying capacity minimum 5t)		
		1	{ Pos. B 2920 mm (Carrying capacity minimum 5t)		
		1	{ Pos. C 2590 mm (Carrying capacity minimum 5t)		
	③	2	Mounted hood with base - 5t	208 310.4612	
	8	+ Cheese head screw M24x60 DIN 912-12.9	410 260.2460		
	④	1	Front lead spreader - 6t	208 315.1456	
		4	+ Cheese head screw M24x60 DIN 912-12.9	410 260.2460	
Transportation safety device	⑤	1	Steel plate red (chip channel)	M72 601.90	Base
		12	+ Cheese head screw M8x12 DIN 912-12.9	410 260.0812	
	⑥	2	Holder	M71401.30	Operating panel
		2	Ledge	M71401.40	
		4	+ Cheese head screw M6x12 DIN 912-12.9	410 260.0612	
		4	+ Hexagonal nut M6-10	415 610.06	
		12	+ black finished plate St B 6,4 brüniert	419 010.06	
Other transporting material		4	+ Cheese head screw M6x16 DIN 912-12.9	410 260.0616	
		1	Plastic cover (4000 x 2200 x 2000 x 0,2)	398 572.1081	
		1	Anti-slip mat	288 000.0030	



The cheese head screws are meant for **one-time use only**.
The tightening torque of the screws can be seen from the respective screw standard.

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Unloading the Machine with a Crane or a Mobile Crane



**Use a crane with sufficient load bearing capacity.
Unload the machine as near as possible the place of installation . Short transport distances reduce the hazards.
Lift the machine only using the appropriate lifting tackle.**

Height of crane hook above ground level:

Height of the unit (e.g. Machine, control cabinet etc)refer to picture
+ Lifting tackle or length of slings above the unit.....refer to picture
+ Floor height of truck.....approx 1,3 m
+ hoisting.....0,2 m

Remove all securing members for the transport on the truck.

Remove top and sides of crate.

Attach the supplied lifting tackle (refer to section "Attaching the transportation tackle to the machine").

Lift crane hook to equally tighten the slings.



**Attention must be paid that the ropes do not touch the machine.
Never stand under the suspended machine.**

Lift machine slowly and carefully.



**Take care that the machine is kept horizontal. The centre of gravity is not exactly in the middle of the machine.
If necessary lower the machine and correct the slant by altering the rope lengths (e.g. shorter rope at heavier end) or by moving the hooks on the girder.**

Lift machine off the truck or more truck from under the suspended machine.

Positioning of the transport means under the machine.



**Ensure that the chosen transport means has sufficient load bearing capacity. It must be at least equal to the machine mass.
When using a trolley the load bearing area must be larger than the machine area (floor area).**

Lower machine slowly and carefully onto the transport means, remove the lifting tackle and move the machine to the place of installation.

When the machine is unloaded with a crane at its place of installation the suspension tubes may be left in the machine on its way there.

Lowering the Machine in the Place of Installation

When the definite place of installation has been determined and accordingly prepared (refer to chapter „Planning before Installation“) the machine can be directed there carefully and lowered.

Lowering the Machine ...

...with a crane or a mobile crane

Lift the machine with the crane until it is suspended observing the instructions in the chapter „Unloading the Machine with a Crane or a Mobile Crane“.

When you have moved the machine to the place of installation on a trolley or on a castor trolley pull these out from under the machine.

...with hydraulic jacks (Picture)

Hydraulic jacks are required when the use of a crane is not possible at the place of installation.

As it is not allowed to use a fork lift truck for lowering the machine you must select a means of transport corresponding to the lifting height of the hydraulic jacks.

INDEX recommend the use of castor trolleys as the loading level is low. (Refer to chapter „Transport with a Castor Trolley“).

Only special professional hydraulic jacks with the following specifications may be used:

- The hydraulic jacks must have sufficient load bearing capacity.
- The jacks must stand securely during jacking-up and lowering, they must not tend to tilt.
- The load must not be able to slide.
- Delicate stepless lowering must be possible.
- The load must not be damaged during lifting and lowering.



When lifting or lowering the machine with hydraulic jacks three-point support must be ensured: Two caterpillar roller casetter or resting on the floor on one side and hydraulic jacks on the other side.



Always jack up only one short (narrow) side of the machine. The other short side must stand on the means of transport or on the floor.

Never lift the machine higher than absolutely necessary.

As the centre of gravity does not lie in the middle of the machine the load bearing capacity of one jack should be at least 1/3 of the machine mass when using 2 hydraulic jacks.

When working with only one hydraulic jack its load bearing capacity should be minimum 2/3 of the machine mass.

Lift the machine step by step and support the machine after each step by packing suitable blocks of wood underneath. Same applies for lowering.

Transport with Castor Trolleys

Use a castor trolley when there is no suitable crane or a mobile crane.

The advantage of castor trolleys is the low loading height which allows loading and unloading the machine using a hydraulic jack.

Disadvantages are the relatively small wheels (castors) which require a solid smooth floor with appropriate load bearing capacity, transport is very slow and must not be jerky.

For transport you need rigid and steerable transporting rollers. The carrying capacity of the individual transport roller may be less than the mass of the machine. For details, please refer to the descriptions on the following pages.

Procedure with transport

- The transporting rollers are placed under the machine base at the short side of the machine, namely the rigid transporting rollers at the spindle end side and the steerable ones at the opposite side.
- If the machine stands on a crate base (in case machine is transported in a transport case) or on planks which are fixed to the machine, the rollers may also be placed under the planks.
- Lower the machine slowly until it rests on the transporting rollers.



Link the rigid rollers with one another by means of a steel rod and link the rigid and the steerable rollers by means of steel ropes. This prevents displacement of the trolleys when pulling them along.



The transporting rollers may only be placed beneath the machine feet. Any other placement of the rollers causes severe damages to the machine.

Use of Caterpillar Roller Cassettes

Caterpillar roller cassettes enable maneuvering the machine in a minimum space. When placing turn tables on top they will be steerable.

Use caterpillar roller cassettes only when neither crane nor fork lift truck can be used. Conditions: Solid, even and smooth floor with appropriate load bearing capacity. (Possibly laying suitable steel tracks).

Caterpillar roller cassettes are not suitable for transport over greater distances.

Caterpillar roller cassettes with high load bearing capacity should be used, as these roll better since the rollers have a larger diameter.

A minimum of four caterpillar roller cassettes placed under the leveling pads of the machine as shown in the picture is required.

For placing the caterpillar roller cassettes under the machine it must be lifted with hydraulic jacks. (Refer to chapter „Lowering the Machine in the Place of Installation“).



When lifting or lowering the machine with hydraulic jacks at least three-point support must be ensured: Two caterpillar roller cassettes or resting on the floor on one side and hydraulic jacks on the other side.

The machine should rest preferably on hardwood planks placed between the caterpillar roller cassettes or the turntable and the machine.

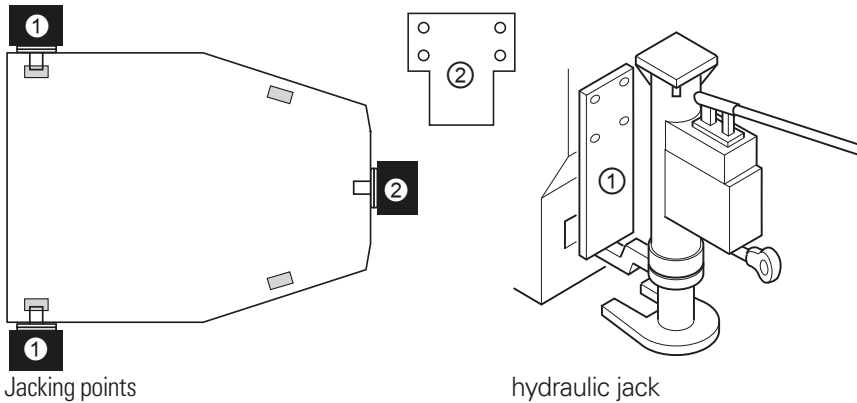
The plank must be of adequate size:

Width	=	4 x width of caterpillar roller cassettes
Thickness	=	min. 30 mm
Length	=	according to width of machine base

MS22-8
MS24-6
MS32-6
MS40-6
MS40-8
MS52-6

Lifting / lowering of the machine by means of hydraulic jacks

Pos.	Description	MS22-6...MS40-8	MS52-6	Order number
①	Lifting device	2	2	208315.1477
②	Lifting device	1	1	208315.1478
	Cheese head screw:			
	• M20x60 DIN 912-12.9	8		410260.2060
	• M24x60 DIN 912-12.9	4	12	410260.2460



- Required items: 2 hydraulic jacks (carrying capacity at least 2/3 of the machine weight each)

For lifting of the machine, lifting devices (steel plates) ① respectively ② must be screwed at the jacking points. Afterwards attach jacks at the lifting devices.

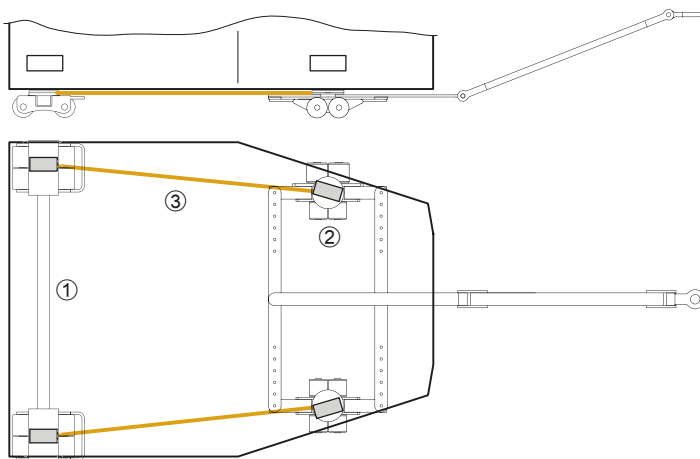


The machine must not be lifted and lowered by other lifting devices than those supplied by INDEX!

Transport by means of transporting rollers or by caterpillar rollers



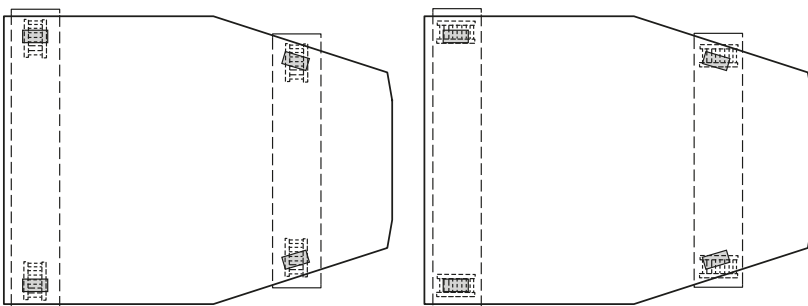
The transporting rollers may only be placed beneath the levelling elements. The structure of the machine frame does not allow any other placement!



Transport by means of transporting rollers

Items required:

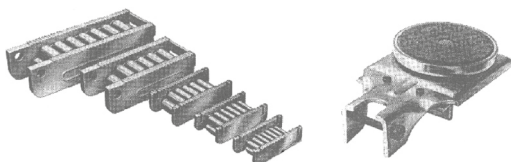
- 2 rigid transporting rollers firmly connected to each other (by steel rod ①). Carrying capacity per roller: at least 1/3 of the machine weight.
- 2 steerable transporting rollers firmly connected to each other ②. Carrying capacity per roller: at least 1/3 of the machine weight.
- Steel ropes ③ for connecting the transportation rollers.



Transport by means of caterpillar rollers

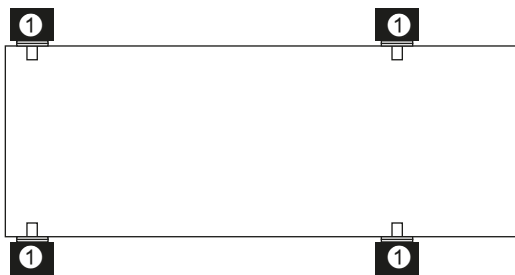
Items required:

- at least 4 caterpillar rollers beneath the levelling elements of the machine.
- solid hardwood planks between machine and caterpillar rollers.
width = approx. 4 x width of caterpillar roller cases
thickness = at least 30 mm
length = according to the width of the machine base
- turning platform (for steerability of the caterpillar rollers).

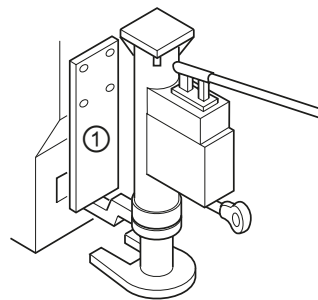


MS16-6 Lifting / lowering of the machine by means of hydraulic jacks

Pos.	Description	MS16-6	MS32P/G	MS40P	MS52G	Order number
①	Lifting device	4	4	4	4	208315.1477
	Cheese head screw M20x60 DIN 912-12.9	16	16			410260.2060
	Cheese head screw M24x60 DIN 912-12.9			16	16	410260.2460



Jacking points



hydraulic jack

Lifting / lowering of the machine by means of hydraulic jacks

- Required items: 2 hydraulic jacks (carrying capacity at least 1/3 of the machine weight each)

For lifting of the machine, lifting devices (steel plates) ① must be screwed at the jacking points. Afterwards attach jacks at the lifting devices.

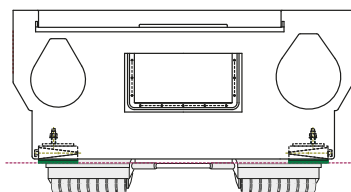
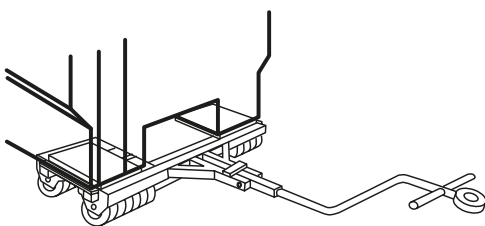
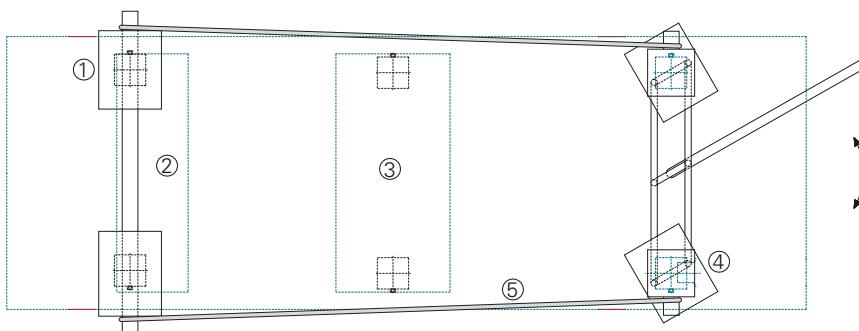


The machine must not be lifted and lowered by other lifting devices than those supplied by INDEX!

Transport by means of transporting rollers or by caterpillar rollers



The transporting rollers may only be placed beneath the levelling elements. The structure of the machine frame does not allow any other placement!



Transport by means of transporting rollers

Items required:

- 2 rigid transporting rollers firmly connected to each other (by steel rod ①). Carrying capacity per roller: at least 1/3 of the machine weight.
- 2 steerable transporting rollers firmly connected to each other ④. Carrying capacity per roller: at least 1/3 of the machine weight.
- Steel ropes ⑤ for connecting the transportation rollers.

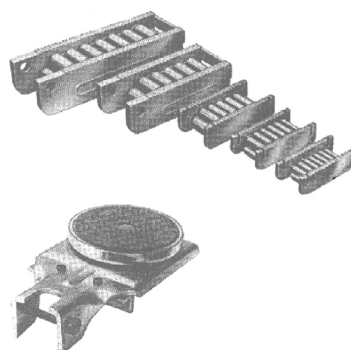
② Headstock 1

③ Headstock 2 (center sleeve housing)

Transport by means of caterpillar rollers

Items required:

- at least 4 caterpillar rollers beneath the levelling elements of the machine.
- solid hardwood planks between machine and caterpillar rollers.
width = approx. 4 x width of caterpillar roller cases
thickness = at least 30 mm
length = according to the width of the machine base
- turning platform (for steerability of the caterpillar rollers).



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MS40-8
MS52-6

Unloading and Transport of Separate Units

Extensions or attachments such as chip conveyor, bar feeds, bar loading magazines are separate units for transport.

For these there are special transport instructions which must be observed (refer to plates on these units or to the appropriate chapters in the relevant, separate operating instructions).

For small separate units there are no special transport instructions.
These units are either on a pallette or they are packed together with other units.

Use for unloading and transport suitable slings or straps.

Attach the slongs or straps in such a manner that they cannot slide off and the unit is safety suspended.

If eye bolts are provided attach the rapes or straps to these.



Never stand under suspended units.

Unpacking the Accessories and checking them for Completeness

The accessories must be checked against the delivery note for completeness after unloading and unpacking (Compare with bill of lading or delivery note).

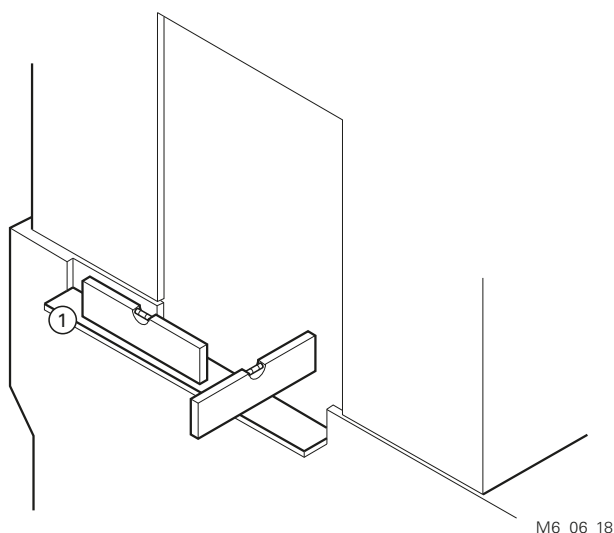
In case of discrepancy please contact your INDEX agency.

MS16-6
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MS40-8
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Installation and adjustment

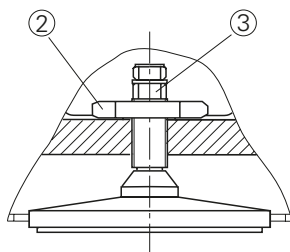
Installation of the machine

1. Transport the machine to the location.
2. When a crane cannot be used at the location the machine must be positioned sufficiently high for a hydraulic jack or an air cushion to be inserted under the turning machine.
 - Unscrew the adjusting screw of the machine foot until the thread is just showing above the locking nut.
3. Lower the machine onto the floor.
4. Check adjustment of the machine to the environment (supply connections, cable channels, other machines)
5. Relocate machine if necessary.



M6_06_18

Fig.: Setting surface for the machine spirit level (only rough levelling)



M6_06_26

Fig.: Machine foot with adjusting screw

Machine levelling

The machine has four or six adjustable feet (adjusting screws resp. wedge-type pads). At said feet the machine is levelled ilengthwise and crosswise..

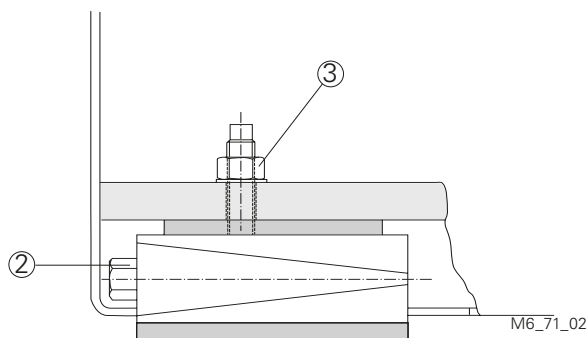
Because of the large weight the machine must be supported with a crane or hydraulic jacks during the levelling procedure.



Attention!

The machine may only stand on the machine feet. The machine base frame must not touch the ground!

Danger of deformation of the machine!



M6_71_02

Fig. Adjustable machine foot (wedge-type pads)

Rough levelling of the machine

1. Set the machine spirit level onto the resting surface for the bar feed ①.
2. Unfasten counter nuts ③ of the base fixing.
3. Level the machine with the aid of the adjusting screws ②.
4. Fasten counter nuts ③ of the base fixing.

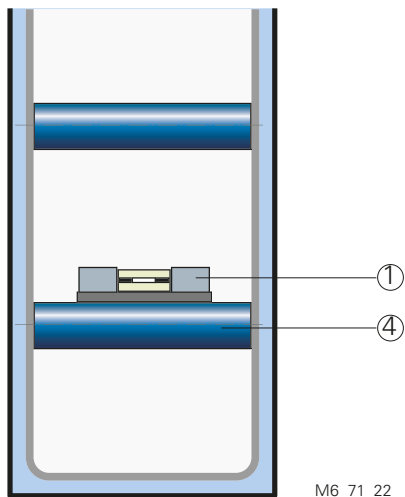


Fig.: Position machine spirit level here for lengthwise alignment

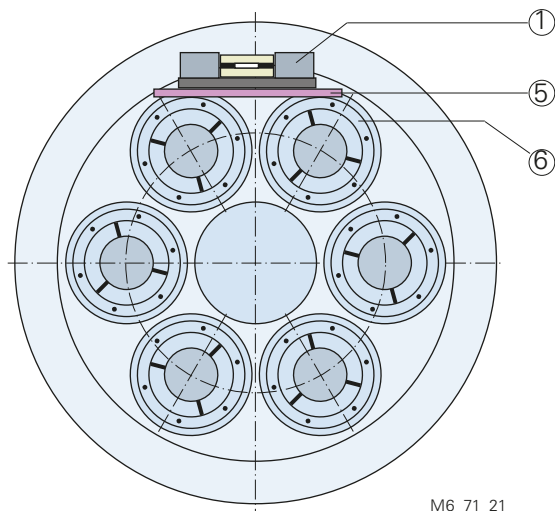


Fig.: Position machine spirit level here for crosswise levelling

Exact levelling of the machine

This method may require some more time and work, however it is recommended by INDEX due to its greater exactness.

1. Lengthwise levelling of the machine
Place the machine spirit level (1) onto the shaft (4) of the support arm on the left hand side in the spindle cabinet.
Crosswise levelling of the machine
Set the machine spirit level (1) by means of a measurement bridge (5) onto the ground spindle heads of the collet receivers (6) of spindle position 4 and 5.
2. Unfasten counter nuts (3) of the base fixing.
3. Level turning machine by means of the adjusting screws (2).
P- and G-machines: Check crosswise and lengthwise levelling at the B-side and re-adjust, if necessary.
4. Fasten counter nuts (3) of the base fixing.

Levelling of machine extensions

Align extensions of the machine (if existing) and carry out crosswise and lengthwise levelling, if necessary.

Anchoring the machine

Never anchor the turning machine in the floor!

Putting-up and alignment of attachments

Bar support, bar feed or bar loading magazine are provided with levelling pads with which they must be aligned with the machine's workspindle or Spindle drum within ± 0.1 mm deviation per 1 m.

Workpiece conveyor belt, palletizing station etc. have levelling elements by means of which they can be levelled longitudinal and transversely to the main spindle turning axis within ± 0.1 mm/m.

(Refer to the chapter "Working Data" or the documentation of the extension.)

MS22-8
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MS32-6
MS40-6
MS40-8
MS52-6

Installation of the chip conveyor and the coolant supply unit

1. Slide the chip conveyor on rollers under the bar loading magazine.
2. Screw together the chip conveyor and the flange of the machine (sealing washer is glued to the flange).
3. Slide the coolant supply unit on rollers under the bar loading magazine.
4. Screw together the coolant supply unit with the flange of the chip conveyor.

There is no need to level the chip conveyor and the coolant supply unit.



MS16-6 see separate Document.

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MS32-6
MS40-6
MS40-8
MS52-6

Securing means for the transport

Movable parts of the machine are secured with painted red securing means for the transport.



Before commissioning of the machine: Remove all securing means for the transport. Save the securing means for transport for a later transport of the machine.

Removing the transportation safety devices

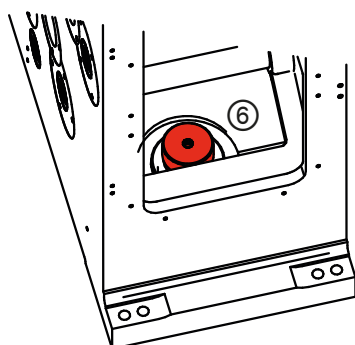
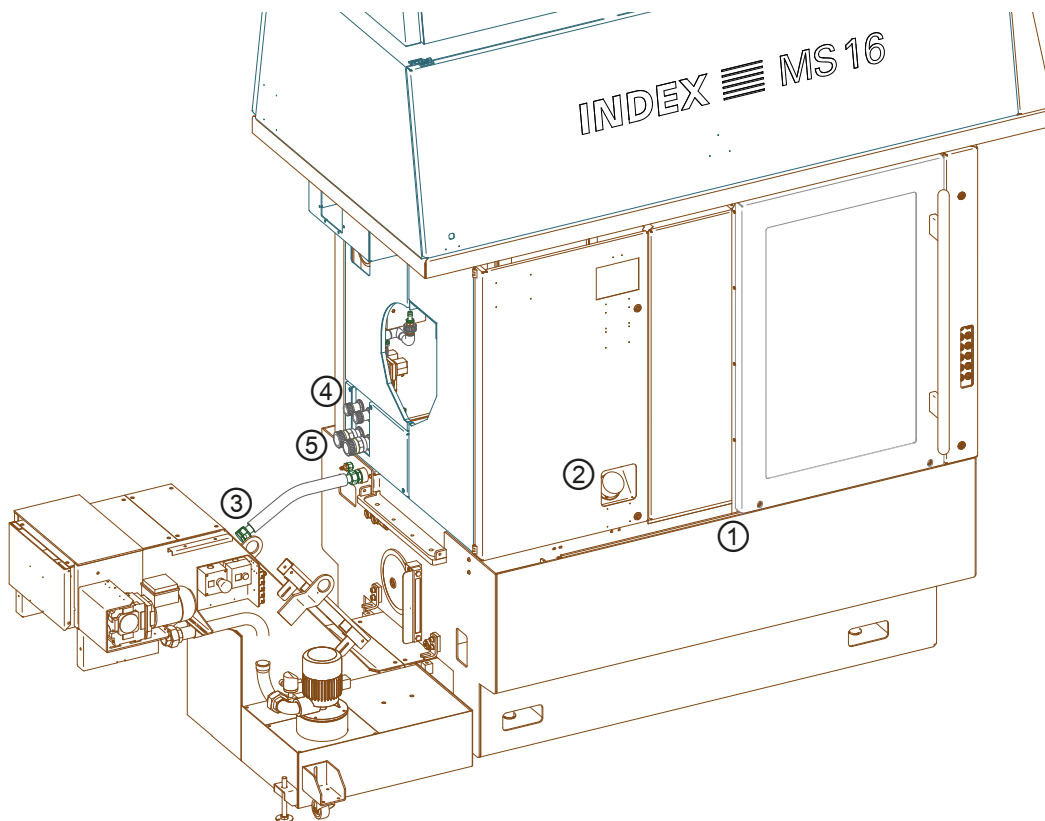
(See pictures on the following pages)

1. If existing, remove securing rope.
2. Remove transportation safety device at operating panel.
3. Remove transportation safety device at sliding hoods ① and open sliding hoods
4. Unscrew screw plug of oil filler neck ②, screw sealing plug on oil-filler neck open and fix safety chain
5. Remove plastic plug ③ from cooling lubricant supply of coolant cleaning system.
6. Remove plastic plug ④ and ⑤ from cooling water system.
7. **MS40:** Remove sealing cap ⑥ at down pipe between headstock and oil tank.
8. Remove tube sealing plug ⑦ from oil return hose between main spindle cabinet and the base.
9. **MS52:** Remove locking cone and union nut ⑧ from the connections at the base.
10. Remove operating panel transportation safety device (refer to respective sections, please).
11. Use hose clamps to connect oil return hose oil tight to hose neck at the main spindle cabinet.
In case of **P** and **G** machine also at centre sleeve respectively counter spindle cabinet.
12. Remove plate from chip channel at base.
13. Remove any transportation safety devices in the machining area (see respective sections on the following pages).

MS16-6

Transportation safety devices at the outside of the machine

Before the first start of the turning machine, remove all transportation safety devices and put them aside for later transport!



Oil return between headstock and oil tank

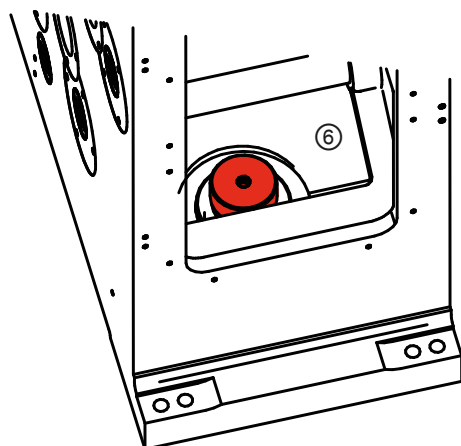
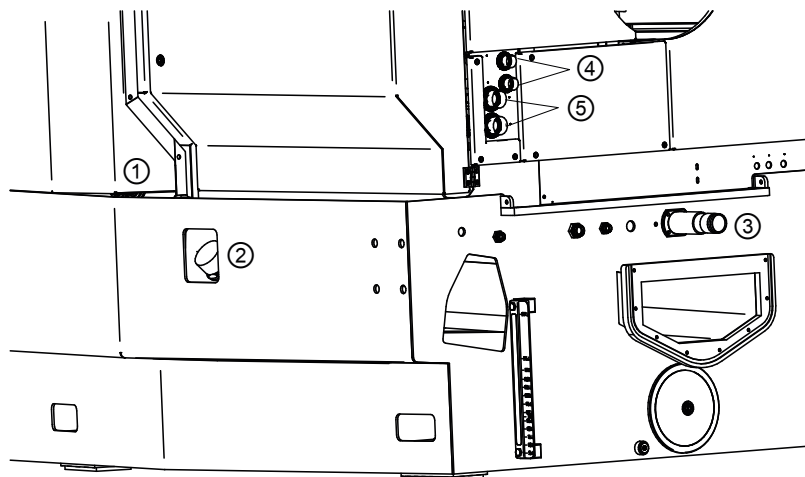
Transportation safety devices

Pos.	Description	MS16-6	Order number
①	Hood lock + hexagonal screw M6x20-10.9	2	K80381.70
		2	410620.0620
②	Screwed sealing plug (oil-filter neck)	1	410770.4220
③	Pipe plug	1	471078.28
④	F26 sealing plug	2	401842.33
⑤	F19 sealing plug	2	401842.20
⑥	Sealing plug + O-ring	1	M90321.108
		1	325773

MS22-8
MS24-6
MS32-6
MS40-6
MS40-8
MS52-6.3

Transportation safety devices at the outside of the machine

Before the first start of the turning machine, remove all transportation safety devices and put them aside for later transport!



Oil return between head stock and oil tank

Transportation safety devices

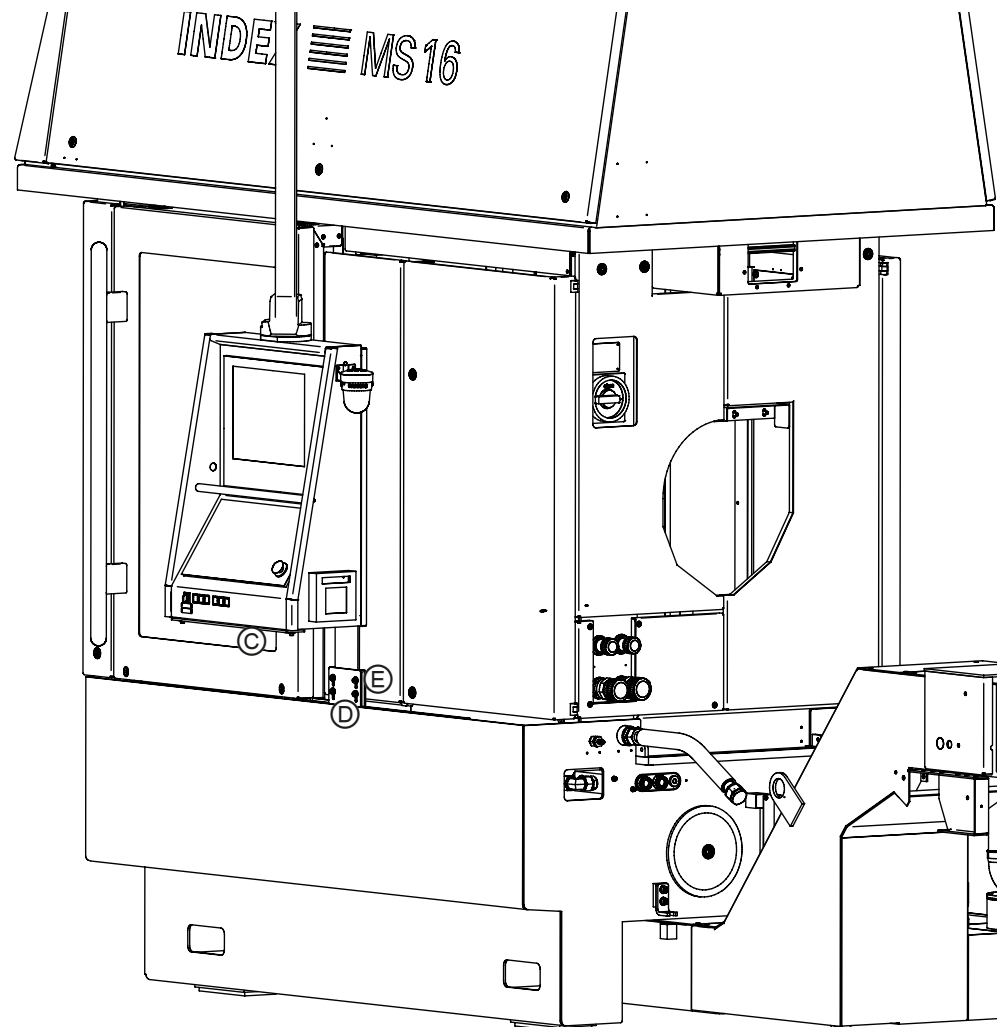
Pos.	Description	Anzahl	Order number
①	Hood lock + hexagonal screw M6x20-10.9	2	K80381.70
		2	410620.0620
②	Screwed sealing plug (oil-filler neck)	1	410770.4220
③	F32 sealing plug	1	401842.46
④	F26 sealing plug	2	401842.33
⑤	F19 sealing plug	2	401842.20
⑥	Sealing cap	1	M80291.

MS16-6

Transportation safety devices of the operating panel**Operating panel MS16-6**

The operating panel is safeguarded at the machine by means of an angle bracket © via a ledger ④ and a holding plate ⑤.

- Screw-off ledger ④ and holding plate ⑤.
- Mount end stops at hinge at the machine.
- Screw-off angle bracket ©.

**In case of re-transport**

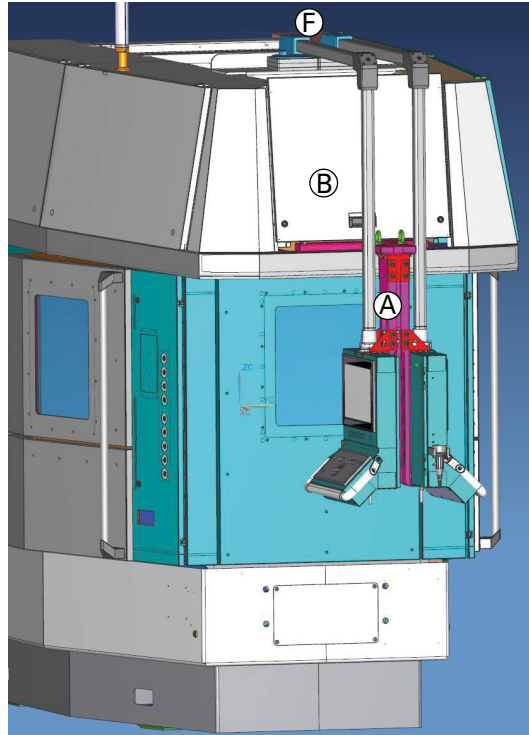
1. Fix angle bracket © by screwing down at the operating panel (
2. Dismantle end stops at the hinge on the machine.
3. Mount ledger ④ and holding plate ⑤ to the angle bracket ©.
4. Fix the operating panel in the guide rail of the rear sliding door by means of the holding plate ⑤.

**MS22-8
MS24-6
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MS52-6.3**

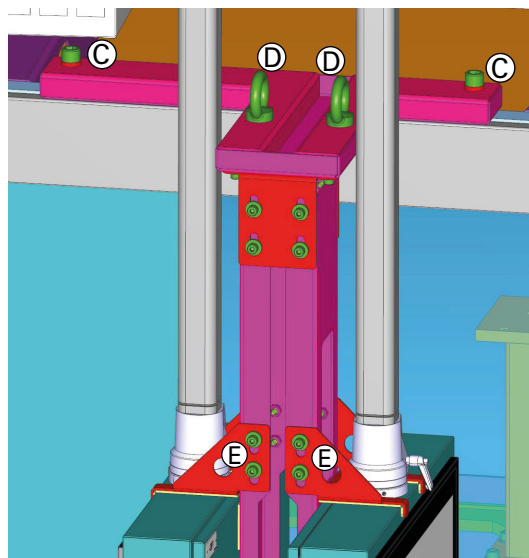
Operating panel transportation safety devices for MS22-8, MS24-6, MS32-6, MS40-6, MS52-6.3

The operating panel has been locked by the operating panel transportation safety device (A).

Remove transportation safety device



- Take off cover (B) from switch cabinet



- Loosen screws (E) at the fixtures with which the operating panel screws have been fixed screw clamp like at the transportation safety device. Now, you can swivel the operating panels.
- Remove screws (C) and take transportation safety device (A) off.
- Unscrew eye screws (D) from transportation safety device and fix them in the threaded holes which have been provided for such screws (position of the screws (C)).

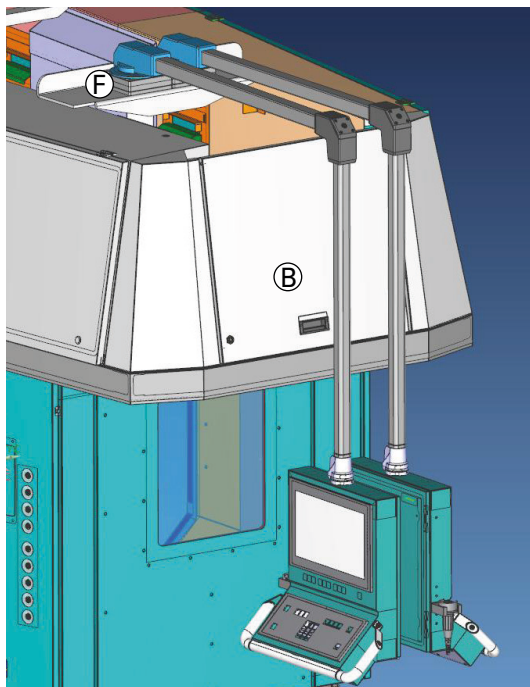


The eye screws (D) serve as fall arresting device for the fixing of ladders and must therefore be re-mounted at the machine. Do NOT remove the above mentioned screws or send them back to the INDEX company.

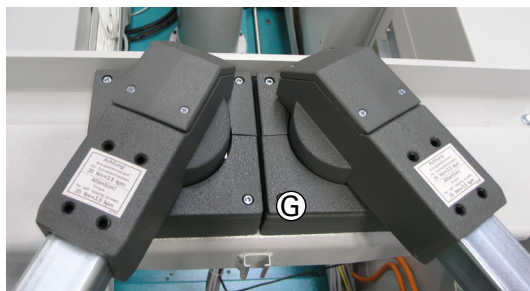


In case of machines equipped with two operating panels, the swivel angle stops (F) must be re-adjusted in such a way to prevent the operating panels from colliding with one another.

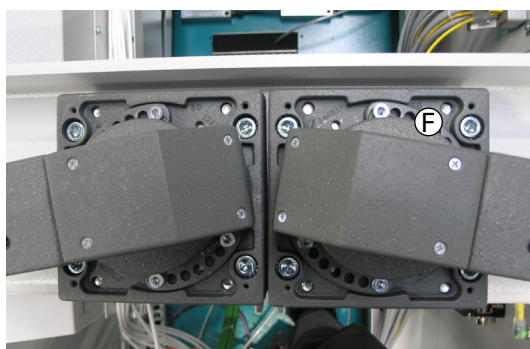
Adjustment of the swivel angle stops for machines equipped with 2 operating panels



Ⓕ Swivel angle stops in case of machines equipped with 2 operating panels



– After taking off the two covers Ⓒ located on the switch cabinet, you can freely access the discs Ⓕ .



– To terminate, re-mount cover Ⓒ at the switch cabinet.



The operating panel transportation safety device and other transportation safety means may be sent back to or may be acquired at the INDEX company.

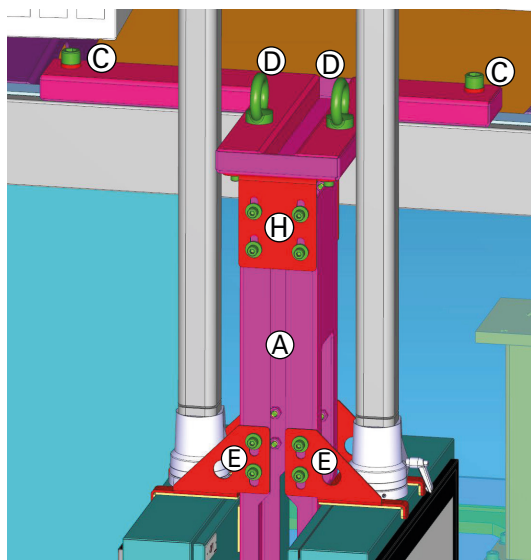
In case of re-transportation For re-transportation of the machine, you can lease or buy a special operating panel transportation safety device from the INDEX company (which is also available for machines manufactured before 2015).

Operating panel transportation safety device (A)

Machine	Order no..
MS22-6	GM2101.9659
MS22-8	GM2101.9615
MS32-6.2	GM2101.9615
MS40-6	GM2101.9615

Prepare operating panel transportation safety device for re-transportation of the machine

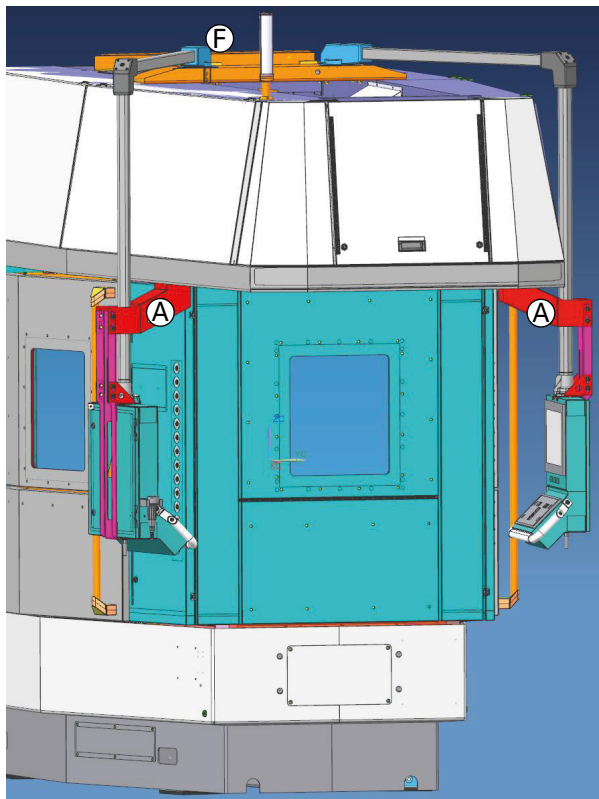
(The descriptions in the illustrations partly refer to previous pages.)



- Demount cover (B) from switch cabinet.
- **In case of machines with 2 operating panels**, you must adjust the swivel angle stops (F) in such a way that the two operating panels can touch each other at the front side of the machine.
- Unscrew the eye screws (D) from the threaded holes at the machine and screw them into the threaded holes which have been provided for said screws at the transportation safety device
- Fix the transportation safety device at the intermediate ceiling of the machine from above by fixing the screws (C) in the threaded holes provided for them.
- Swivel the operating panel/s rear side forward into the transportation safety device (A).
- Clamp the two adjustable and cushioned holders to the operating panel like screw clamps and tighten by means of screws (E).
- For weight unloading of the operating panel boom, push operating panel plus height adjustable holder upward and tighten the 4 top screws (H) at the transportation safety device.

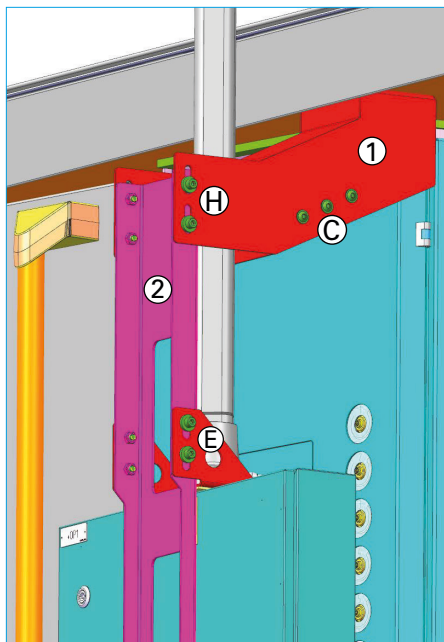
MS40-8

Operating panel transportation safety devices for MS40-8



Each of the two operating panels is secured by its individual operating panel transportation safety device (A). Said safety devices are screwed to the underside of the intermediate ceiling.

Remove transportation safety device

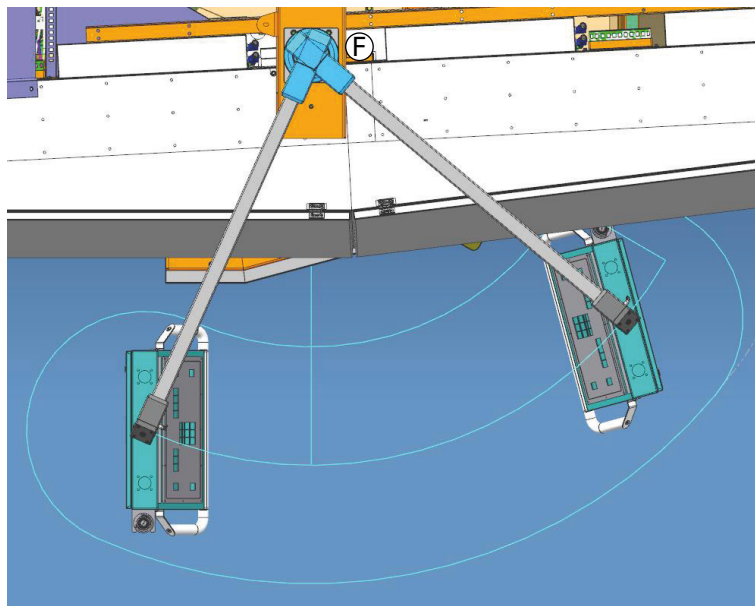


- Loosen screws (E) at the fixtures with which the operating panel screws have been fixed screw clamp like at the transportation safety device.
- Unfasten screws (H) and remove fixture (2) (= lower part of the transportation device).
- Swivel operating panel to the side
- Unscrew and remove the top part (1) of the transportation safety device from the intermediate ceiling of the machine.
- Close the threaded holes at the underside of the intermediate ceiling by means of the correct screws. During transport, said screws (C) are kept safe at the top part of the transportation safety device.

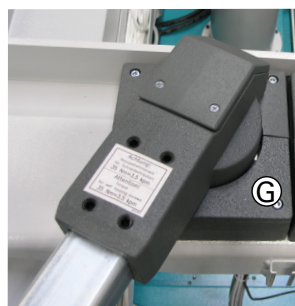


After removal of the transportation safety devices, the pivoting angle limiters (F) must be re-adjusted in such a way that the operating panels do not touch the external face of the machine.

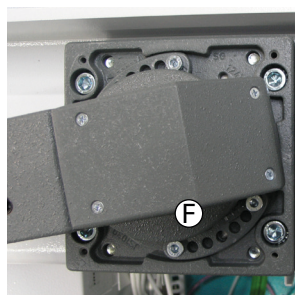
Adjustment of the swivel angle stops



Swivel angle stops MS40-8



- After removal of the cover **G** on top of the switch cabinet, you may freely access the swivel angle limiter discs **F**.



- Adjust the swivel angle limiters in such a way that the operating panels do not touch the external face of the machine.



The operating panel transportation safety device and other transportation safety means may be sent back to or may be acquired at the INDEX company.

Prepare operating panel transportation safety devices for re-transportation of the machine

(The descriptions in the illustrations partly refer to previous pages.)

- Loosen pivoting angle limiter ⑤ .
- Unfasten and remove screws from the thread holes at the underside of the intermediate ceiling and screw them into the thread holes meant for such purpose ③ at the transportation safety device.
- In case transportation safety device has been assembled: remove screws ④ and separate parts ① and ② of the transportation safety device from one another.
- Screw the top part ① of the transportation safety device to the intermediate ceiling of the machine.
- Swivel the operating panel, front side forward, into the upper part of the transportation safety device ④.
- Fix the lower part of the transportation safety device ② by means of screws ④ at the upper part of the transportation safety device, however, do not fasten the screws.
- Clamp the two adjustable and cushioned holders to the operating panel like screw clamps and tighten by means of screws ⑤ .
- For weight unloading of the operating panel boom, push operating panel plus height adjustable holder upward and tighten the 4 top screws ④ at the transportation safety device.

MS16-6
MS22-8
MS24-6
MS32-6
MS40-6
MS40-8
MS52-6

Transportation safety devices in the machining area

Movable parts of the machine are secured by means of transportation safety devices in **red** paint.

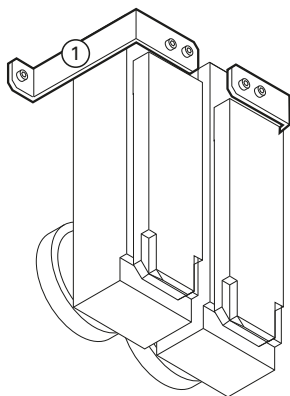
For INDEX part numbers, please refer to the respective paintings of the transportation safety devices in chapter "Work documents".



Before commissioning of the machine: Remove all transportation safety devices. Save the transportation safety devices for a later transport of the machine.

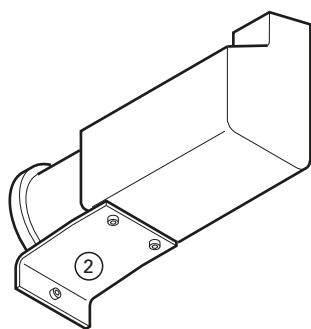
Examples of transportation safety devices

There are different types and versions of **transportation safety devices** which can be attached at the machine. Therefore, only a few examples can be mentioned here:



Transportation safety devices:

- Securing of a transverse unit:
 - Securing plate ①
 - 2 x cheese head screw
 - 1 x cheese head screw M8 x 20 (or thread rod with lock nut)



- Securing of an end working unit:
 - Securing plate ②
 - 2 x cheese head screw
 - 1 x cheese head screw (or thread rod with lock nut)

MS16-6
MS22-8
MS24-6
MS32-6
MS40-6
MS40-8
MS52-6

Commissioning

All the following tasks have to be carried out chronologically before commissioning.

After these have been carried out the machine will be ready for commissioning.

Cleaning the Machine

All bright machine parts are coated with a rust preventing agent. Generally this coat will be washed off by the coolant during the operation of the machine.



When cleaning the machine some of the solvent might splash into the eyes. Protect your eyes by wearing suitable safety goggles. Protect your hands and arms by wearing long sleeve clothing and gloves when cleaning the machine. Risk of bodily injury by sharp edged machine parts and tools!

The rust preventing agent must be washed of manually when the machine is put into operation after a longer period and when the rust agent has become very tough.

Mounting surfaces for toolholders and attachments must be cleaned in any case.

For this purpose only agents that do not attack the machine paint may be used. Suitable are turpentine, paraffin (kerosene) or benzine.

Checking supplies, restocking

Hydraulic system: Check oil level

Coolant system: Fill coolant tank



For notes on the quality of media, such as lubricating oil, hydraulic oil and coolant, as well as on capacity of tanks and charging holes, see chapter "Service and Maintenance" and machine installation diagram in the chapter "Working Data".

Pressure accumulator

For notes, please refer to section "Preparations"

Water cooling system

INDEX Multi-spindle turning machines

Functioning

The water cooling system serves the cooling of the switch cabinets, of the hydraulic oil and of the cooling lubricant. The system is composed of a machine-side cooling circuit and optionally either of

1. a water recirculation cooling unit besides the machine
or
2. an external cooling water circuit which has been made available by the operating company.



For any and all information concerning coolant, water quality and water treatment please refer to document "Information on operating materials".

In case of use of a water recirculation cooling unit refer to the information of the manufacturer, please.

Requirements for the external cooling water supply

Machine	Water temperature [°C]	Cooling water amount Q_{min} / Q_{max} [l/min] / [l/min]	Pressure difference $P_{feed} - P_{reflux}$ [bar]	Required cooling power [kW]
MS16-6 / MS16-6 Plus	20°C ±2°K	71 / 99	> 2	> 27
MS18	20°C ±2°K	71 / 99	> 2,2	> 27
MS22-6	20°C ±2°K	71 / 99	> 2,2	> 27
MS22-8	20°C ±2°K	106 / 140	> 2,3	> 37
MS24-6	20°C ±2°K	106 / 140	> 2,3	> 37
MS32C/-P/-G	20°C ±2°K	71 / 99	> 2,8	> 27
MS32-6 (.2/.3)	20°C ±2°K	106 / 140	> 2,3	> 37
MS40-6	20°C ±2°K	106 / 140	> 2,3	> 37
MS40-8	20°C ±2°K	115 / 140	≥ 2,5	≥ 55
MS52-6.2	20°C ±2°K	80 / 99	> 3	> 27
MS52-6.3	20°C ±2°K	110 / 140	> 2,3	> 44
A200	20°C ±2°K	32 / 40	> 2,6	> 8

Table 1

Ambient temperature: max. 40°C.

The values indicated in table 1 are valid for machines equipped with standard coolant purification system.



**It is imperative to observe the values indicated in table 1!
In case of deviations, an appropriate cooling of the respective machine is no longer guaranteed.**

The maximum operating pressure of 8 bar must not be exceeded!

External cooling water supply

INDEX Multi-spindle turning machines

Connecting several machines to an external cooling water supply system

In case several machines are connected to an external cooling water supply system, INDEX makes the following provisions to guarantee reliable operation of said machines:

1. Equip the cooling system with frequency controlled pumps. By this, pressure fluctuations due to different cooling water amount use by the different machines will be balanced and overpressure will be prevented.
In case of atmospherically open systems, regulation of the frequency controlled pumps must be carried out with constant pressure regulation. In case of closed systems equipped with surge tank, differential pressure regulation is required.
It is **NOT** allowed to regulate the frequency controlled pumps via temperature respectively differential temperature! Such procedure would interfere with the in-machine flow rate monitoring and with the internal control of the cooling system.
2. INDEX machines are equipped with internal shift valves which control the supply of the respective heat exchangers according to requirements. For this reason, you must heed that the water amounts which are taken out of the central cooling water supply system may be highly fluctuating.
3. Install an overpressure relief valve in the cooling water conduit.
4. Heed the minimum pressure difference in the cooling water conduit between feed and reflux line at the machine (see table 1).
5. Throttle the individual cooling water amount of the individual machines by setting the flow control valve at the respective machine to the required value (see table 1). This will guarantee an equally distributed cooling water supply for all machines.
6. Please see to it, that all supply lines to the machines are installed as straight as possible. Thus you prevent velocities caused by pressure increase pumps or direction changes of the lines which may result in troubles of the flow rate sensors.
7. Install thermometers and manometers in the feed and reflux lines of every cooling water conduit, in order to be able to analyse the failure cause in case of error. |
8. Install a filter (filter mesh < 0.1 mm) with locking option in the feed line of the cooling water conduit of all machines.
9. Instal stop cocks or magnet valves for every machine so that any of the machine can be disconnected individually if it needs repair.
10. Disconnect the machines from the water network (e. g. via magnet valves) when switching the machines OFF (via the main switch) so that there is no flow through the switch cabinet any longer.
11. Before connecting machines, which are not listed in table 1, to the external cooling water supply system, you must in any case consult the service department of the INDEX company first.



INDEX disclaims any liability for secondary damage due to the de-activation of the machine side monitoring system.

Central cooling lubricant supply

INDEX Multi-spindle turning machines

Required cooling lubricant performance

- ➔ INDEX MS-machines may exclusively be operated with non-water-soluble cooling lubricants (mineral based cutting oils).
- ➔ The cooling lubricant must not contain any abrasive residues of grinding material like e.g. corundum or cubic boron nitride.
- ➔ Particle size in the cooling lubricant <80 µm
- ➔ Viscosity between 5 and 32 mm²/s at 40°C
- ➔ Temperature between 25 and 35°C

Required pressures and volume flows of the cooling lubricant flowing to the machine

		MS16-6	MS22-6 ... MS40-6	MS40-8, MS52-6
ND	Pressure	3 - 8 bar	3 - 8 bar	3 - 8 bar
	V	max 65 l/min	max 300 l/min	max 300 l/min
	H-Empf	60 l/min at 7 bar	280 l/min at 4 bar	260 l/min at 4 bar
ND Spül	Pressure	–	–	3 - 8 bar
	V	–	–	30-60 l/min
	H-Empf	–	–	40 l/min at 4 bar
HD	Pressure	max 16 bar	max 40 bar	max 40 bar
	V	15 - 30 l/min	55 - 110 l/min	60 - 115 l/min
	H-Empf	20 l/min at 16 bar	55 l/min at 40 bar	60 l/min at 40 bar
KSS-Syn	Pressure	max 16 bar	max 20 bar	max 20 bar
	V	5 - 10 l/min	10 - 15 l/min	10 - 15 l/min
	H-Empf	Filtering to < 60 µm 10 l/min at 16 bar	Filtering to < 60 µm 10 l/min at 20 bar	Filtering to < 60 µm 10 l/min at 20 bar
HD-Z	Pressure	max 80 bar	max 80 bar	max 80 bar
	V	max 25 l/min	max 25 l/min	max 25 l/min
	H-Empf	25 l/min at 80 bar	25 l/min at 80 bar	25 l/min at 80 bar
Σ 1)	V	max 115 l/min	max 400 l/min	max 400 l/min
RFP 2)		0,8 bar at 120 l/min	0,8 bar at 410 l/min	0,8 bar at 410 l/min

Table 2

- 1) Supply of cooling lubricant to the booster station: the sum of HD, ND, ND-Spül, KSS-Syn and HD-Z must not exceed the max volume flow value.
 - 2) In case you use the standard recirculating pump RFP in the chip conveyor, the pressure loss in the feed line must not exceed 0.2 bar.
- ➔ The use of other pumps with different pressures and feed rates is subject to prior consultation of and authorisation by the INDEX company.

Legend

KSS	cooling lubricant
HD	high pressure
ND	low pressure
Spül	rinsing unit
Syn	synchronised unit
HD-Z	additional high pressure (optional)
V	volume flow
H-Empf	manufacturer's suggestion
RFP	recirculating pump

MS16-6
MS22-8
MS24-6
MS32-6
MS40-6
MS40-8
MS52-6

Electrical connection



Caution! Danger of Life!

All work on the electrical equipment must be carried out exclusively by properly trained qualified personnel.



The control voltage is to be connected, according to EN 60204-1, one sided with PE. Please read the notes in the wiring diagram.

The switchgear cabinet may be opened only after the main switch have been set to the OFF position, and it must be secured according to the valid safety standards.

Switching-on the Machine

See chapter "Operating the machine".




Always charge the coolant tank before switching on the coolant pump. A dry running coolant pump will get damaged.


MS16-6
MS22-8
MS24-6
MS32-6
MS40-6
MS40-8
MS52-6

Inspection after the Installation

After the connection the direction of rotation of one of the following motors must be checked:

Motor for	Inspection
Hydraulic pump (AC-motor)	<p>Motor must run in the specified direction (shown by arrow on the motor). Simple checking is possible via the hydraulic pressure monitoring. There will be no pressure in the system when the motor is running in the wrong direction.</p> <div style="display: flex; align-items: center; justify-content: center;">  <p>Damage will be caused to the hydraulic pump when running it in the wrong direction.</p> </div>
Coolant pump (AC-motor)	Motor must run in the specified direction (Shown by arrow on the motor).
Fan on spindle motors or main drive motor (AC-motors)	Air must be sucked into the filter.

Loss of data after a longer idle period



The machine is only fully operable only after complete data input.

When the machine has not been in use for a long period of time the data in the RAM can be lost.
 In such a case the data must be entered again before starting up the machine.

The data are saved in the commissioning sheet and stored on a memory device. The commissioning sheet and the memory device are stored in the document box on the control cabinet door.

MS16-6
MS22-8
MS24-6
MS32-6
MS40-6
MS40-8

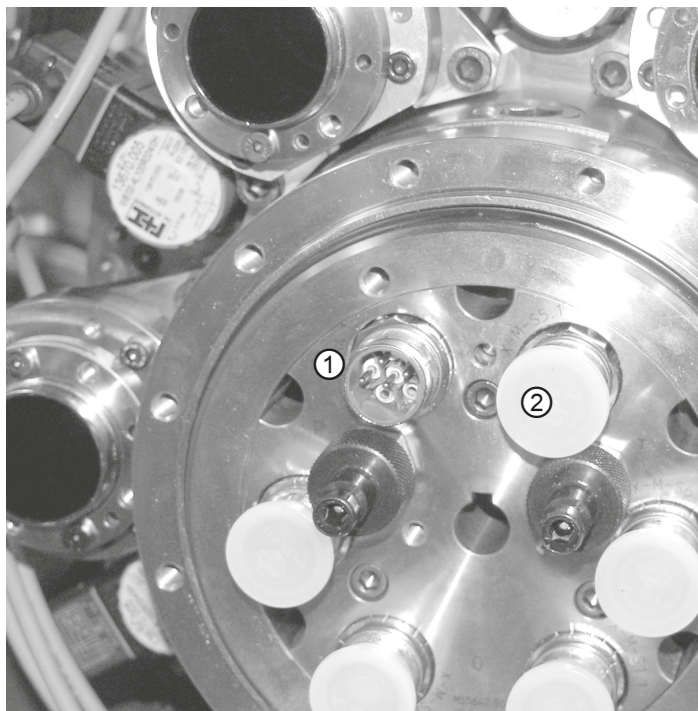
Electric connector between spindle and feeding attachment

Mounting of motor plug



Under unfavourable circumstances dirt and oil residues in the connectors between spindle and feeding attachment may result in damage (the connectors may catch fire) and in production breakdown.

- Mind absolute cleanness when mounting plug and socket between spindle and feeding attachment. Immediately remove oil residues from the contacts and connectors.
- For cleaning only use the Rivolta SLX 500 cleaner (which is part of the machine accessories). Flush oil residues out.
- Whenever you unplug the connector, protect the contacts against dirt by attaching plastic caps.



M6_71_28

- ① Connector without cap
- ② Plastic cap

MS16-6
MS22-8
MS24-6
MS32-6
MS40-6
MS40-8
MS52-6

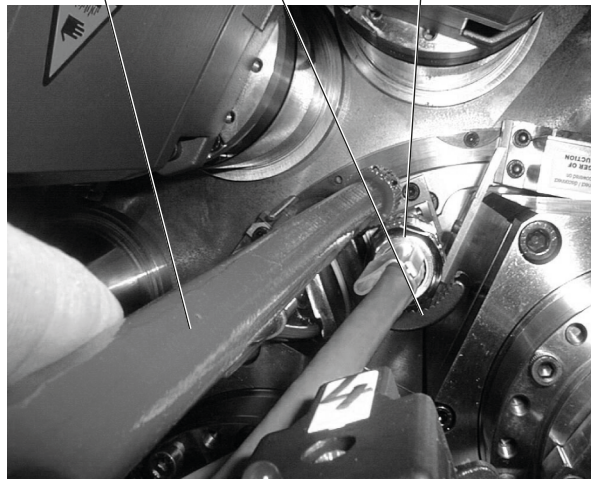
Connect outgoing line (transmitter line)

- When attaching the transmitter line heed correct position of the plug enclosure (pin) to the angle socket (groove). Therewith plug in the contact pins carefully and **without force!**
- Thereafter screw the transmitter line into the angle socket manually by constant rotation of the connecting nut.
- Tighten the connecting nut by agitating the plug enclosure.
- At last tighten the connecting nut by means of a special tool*). See photo.



To prevent the penetration of oil and moisture, heed absolute tight fit of the outgoing plug in the angle socket!

Tool with attachment at plug



M6_71_28

Photograph: Tightening of transmitter line by means of tool

Motor temperature monitoring (general)



Penetration of oil or moisture in the transmitter connection or in the connection with the temperature monitoring system, e. g. due to defective coating of the line connecting the temperature monitoring system, which may be even increased by the capillary effect, may lastingly impair the functioning of the pulse transmitter and/or the temperature monitoring system of the spindle motor. Therefore:

- Immediately replace lines with defective coating
- Clean plugs and sockets which have been moistured by oil and wet before the next use. [cf. Notes "Execution and Procedures" in section 2)]!

*) Tool can be ordered from:

- INDEX (order no. 203016.4000)
- or from WÜRTH Industrie Service GmbH & Co. KG, Drillberg, D-97980 Bad Mergentheim, Tel.: +49 (0) 7931 91-0
make: WÜRTH order no.: 0715 43 015 (costs: less than 50 Euros)

MS16-6
MS22-8
MS24-6
MS32-6
MS40-6
MS40-8
MS52-6

Grease lubrication programme



The transport has effects on the spindles which are supposed to be built in after the transport (main, counter and synchronised spindles). Therefore, it is imperative to run a greasing programme to lubricate the system before the first setting into operation and after every new **method of slinging**.

Said programme was pre-defined by INDEX and has been backed-up in the workpiece list of the control system.

MS16-6
MS22-8
MS32-6
MS40-6
MS40-8
MS52-6

Preparation for repeated transport

Positions of slides and synchronised spindles during transport

	direction	unit	MS16-6	MS22-6	MS22-8	MS24-6	MS32-6.3	MS40-6	MS40-8	MS52-6.3
Headstock 1										
Cross units in	Z	mm	135	98	98	104	128,5	150	150	174
MS24-6 - Cross unit of position 6.1/6.2		mm				24				
MS32-6 - Cross unit of position 6.2		mm					58,5			
Quereinheiten in	X	mm	90,5	120	120			140	137	178
MS16-6 - Cross unit of position 6.0	X	mm	123							
MS16-6/MS32-6 - Burring slide	X	mm	101				93,5			
Longitudinal units in	Z	mm		98	98	104	124	150	150	1)
Synchronised / counter spindle	Z	mm	182,5							
Synchronised swivel spindle	Z	degrees		196	196	212	242	243,5	203	195
Swivel angle of position 5.2 / 7.2		degrees		120°	90°	121°	123°	130°	180°	0°
Swivel angle of position 6.1 / 8.1		degrees		-120°	-90°	-61°	-63°	-120°	178°	0°

Tab. 3

1) Any position due to transport safety device in the form of thread rod

Transverse units, longitudinal units, synchronised spindles

1. Dismantle obstructing tool carriers or attachments
2. Move cross and longitudinal units as well as synchronised spindles into such positions that the safety plates can be installed (see table).
3. Fix the securing plates.

- Operating panel safeguarding devices** – Refer to respective notes in section "Transportation safety devices".

- Oil filter neck**
 1. Unscrew sealing cap from oil filler neck.
 2. Seal oil filler neck with screw plug.

- Oil return hose**
 1. Between main spindle cabinet and base: Remove hose clamps from oil return hose and pull off oil return hose from the hose neck. (In case of P and G-machines also at centre sleeve respectively counter spindle cabinet)
 2. Seal oil return hose with sealing plug.

- MS40: Oil return between headstock 1 and oil tank** – Close headstock 1 by means of cover lid

- Oil sight glass** – Protect oil sight glass against damage

- Sliding hood** – Fasten sliding hood securing devices with screws.

- Electric connectors between spindle and feeding attachment** – When unplugging the electric plug and socket between spindle and feeding attachment, protect the plug contacts against dirt by attaching plastic caps. (See respective section of this manual.)

MS16-6
MS22-8
MS24-6
MS32-6
MS40-6
MS40-8
MS52-6

Transporting tackle

- See chapter "Transport of the machine".

Water cooling

- Connect cooling water installation by means of sealing plug.
Attention! Press sealing plug into opening, however NOT over thread!

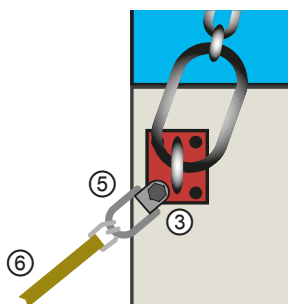
Pressure accumulator



For shipping as airfreight all charged pressure accumulators on the machine have to be de-pressurised by a specialist.

Set main switch to OFF and secure against switching on.

Depressurize the hydraulic system by opening the pressure accumulator valves.



Lashing the machine on the truck

- Mount four load frames (5) with cheese head screws M20 x 100 at the steel plates of the transport hooks (3).
- Fix lashing straps (6) at the fixing rings (5) or at the rings existing at the transport hook or at the load girder.

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