wire rope hoist operating and maintenance instructions

GÜRALP®
VİNÇ ve MAKİNA

The purpose of the manual, which has been prepared by Güralp Vinç ve Makine is to provide crane operators with sufficient user guidance, as well as rules to be noted and information regarding safety matters including periodical servicing and performance information. This manual includes information about machine assembly, installations, commissioning, testing, trouble shooting, maintenance and repairs.

Basic Information

Wire rope hoists that mentioned in this guide book are produced in terms of national and international CE quality standards. Please double check if there are any damages that occured during transportation. If there are any, it is necessary to report all damages. Never carry out an installation using damaged parts.

Assembly
Installation
Commissioning
Test
Maintenance and Repair

All work mentioned above should be performed by a qualified employee, who doesn't have any difficulties working at height and has a good health report!

Employment conditions

Operator
Crane operators are required to take the appropriate trainings. Operator's tasks are stated at article E.1.

Trained employee
All employees are required to have the appropriate training and also should know how to participate in risk assessments and have a good knowledge of safety regulations.

Qualified electric technician
Should have good knowledge about electrical crane equipments and also should know how to avoid any electrical risks.

Qualified employee
A person who has practical and technical knowledge about cranes is called a qualified person. These individuals should also monitor safety regulations for assembly premises.

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A.1 Symbols

Work safety
This symbol is used for all risk assesments, details and information.

Warning of electric voltage
Only people who have the relevant license or have needed training can respond to failure.

Warning of suspended load
It's forbidden to stay under suspended loads. This might cause risk to life.

Safety in operations
Includes observing operations safety and prevent any failure at the hoist.

A.2 Instruction book: Read carefully the maintenance and instruction book.

A.3 Use for intended purpose

- Wire rope hoists are designed to lift vertically. Depending on the design, they can either be stationary or mobile.
- If any fundamental alterations and modification changes are made to the wire rope hoists components, such as, motor speed or to the hoist trolley, the manufacturer company should be informed. Authorized people from the manufacturer company could respond to failure. Otherwise, CE declaration of conformity will be invalidated.
- If the load being pulled in a horizontal direction is overloaded it may cause some issues. This safety check is not the responbility of the product company.
- Any constructional work on the crane including adding parts has to be authorised by the producer of the company. The manufacturer cannot accept any liability for malfunctioning of any unauthorized work on the control. Any failure caused by user is not the responsibility of the producers company.

Not permitted

- Exceeding the safety working load.
- Pulling the load at an angle.
- Pulling loads loose. Loosen the wire rope by putting the hook on something and taking the weight of hook.

A.4 Safety-consciously operations

- Operator should work carefully to maintain the necessary safety considering the potential risks.
- Work area should have sufficient light.
- Instruction book should be read carefully before using the crane.
- Do not lift anything over the maximum load limit.
- Staying under the load is forbidden and dangerous
- While the crane is working you should not interfere with any moving parts.
- Crane operator's duties are provided in the article E.1
- Before you start to work on the crane ensure that you can locate the emergency stop button. It's usually in the control pendant.
- Emergency stop button should not be used as a general control button. Emergency stop button should be on whilst the crane is not being used.
- The cranes start and stop duties should be performed by a control button.
- When the crane is out of circuit, all the safety measures should be taken, failures and damages should be reported, and crane should not be used until it is fixed.
- Damaged ID and Information stickers should be changed immediately.

A.5 Safety measures

- Only qualified people who have crane operation training can use the crane.
- Crane operators should always check the load and safety area.
- Crane operators are required to be at the legally acceptable age limit and should be using personal protective equipment and clothing.
- This instruction book should be kept at an easily accessible place.

A.6 Installation, commissioning, maintenance and repair

- Installations, commissioning, maintenance and repair may only be carried out by qualified staff.
- It is more convenient for the installation to be carried out by the producer company.
- It should not be altered or modified in any way nor should any equipment be added.
- Use only original spare parts.
- If the wire rope hoist is constantly operated outdoors and exposed to the surroundings without protection, we strongly recommend fitting a small roof or at least parking the hoist under a roof.

A.7 Guarantee

If any of these operating instructions are not observed for inspection, maintenance, installation and operation, the guarantee will become invalid. These are:

- Failures and damages caused by usage error.
- After delivering the product to the customer, any failures and damages caused while carrying.
- Failures and damages caused by black out or high voltage, wrong electric installation or also not following the instructions which are on the products instruction label.
- Failures and damages caused by working the hoist over maximum load limit.
- Any failures and damages caused by fire, flood, earthquake, storm and other natural disasters.

Attention! Guarantee is invalid when there is any alterations and modifications on the crane or not using the original spare parts.

A.8 Periodic tests

- Cranes should be checked at least once a year and the results should be recorded.
- A crane service certificate should be issued after inspection.
- Periodic test is compulsory for crane usage. Over usage will inevitable reduce the intervals between services.

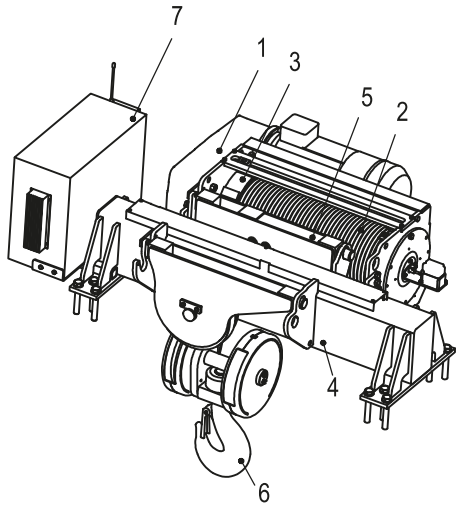
A.9 After sale services

- After purchasing the product, you will also have hoist equipment which include high quality component equipments. Having the best performance of the crane like the first day, will be maintained by authorised service and maintenance staff. For the nearest service station, please check the back page of this guide book.

- Wire rope hoists with the modular structure let more than one variation. (Stationary, Monoray, Double Girder)
- Our hoist machines comply with national and international standards and are in accordance with the CE branding conditions.

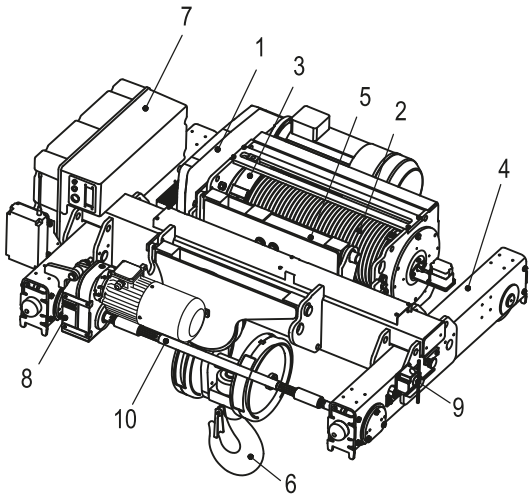
B.1 Stationary hoist

1. Hoisting motor, gear box, break group
2. Drum
3. Wire rope guide
4. Carrier chassis group
5. Overload switch
6. Hook group
7. Control panel



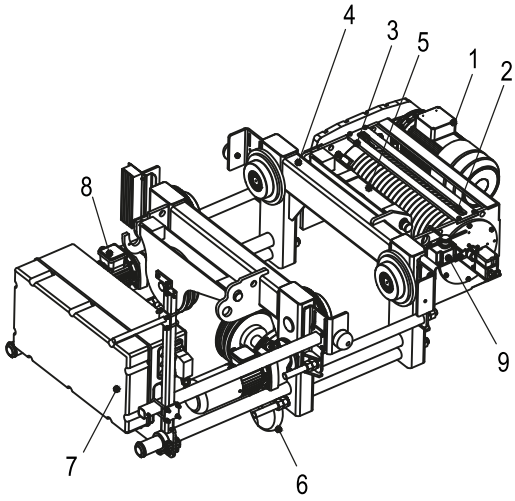
B.2 Double girder hoist

1. Hoisting motor, gear box, break group
2. Drum
3. Wire rope guide
4. Carrier chassis group
5. Overload switch
6. Hook group
7. Control panel
8. Travelling motor, gear box, break group
9. Limit switch
10. Shafting group



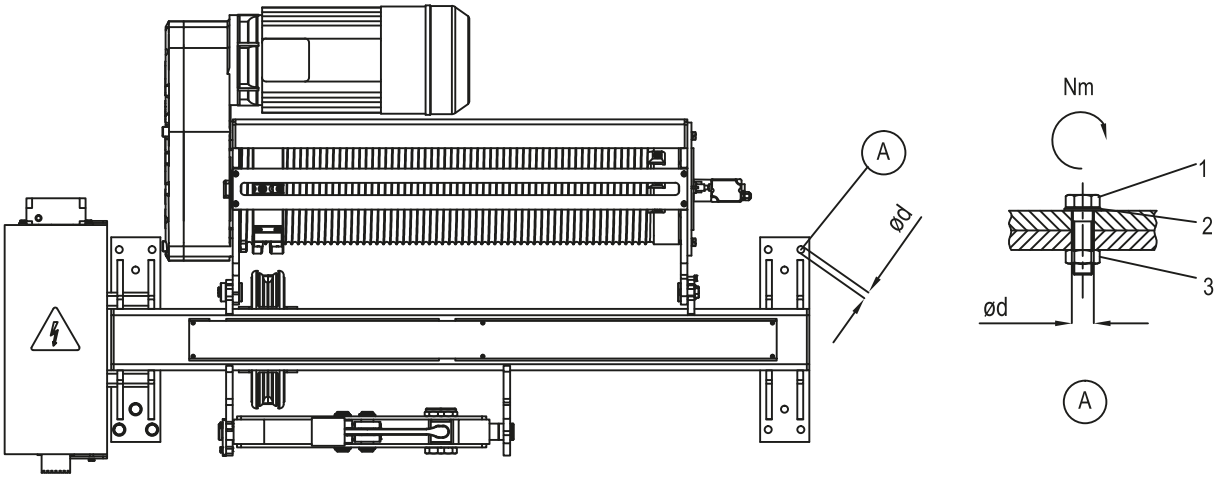
B.3 Monorail hoist

1. Hoisting motor, gear box, break group
2. Drum
3. Wire rope guide
4. Monorail carrier chassis
5. Overload switch
6. Hook group
7. Control panel
8. Travelling motor, gear box, break group
9. Monorail switch



C.1 Stationary hoist

- Stationary wire rope hoist connection position, torque table



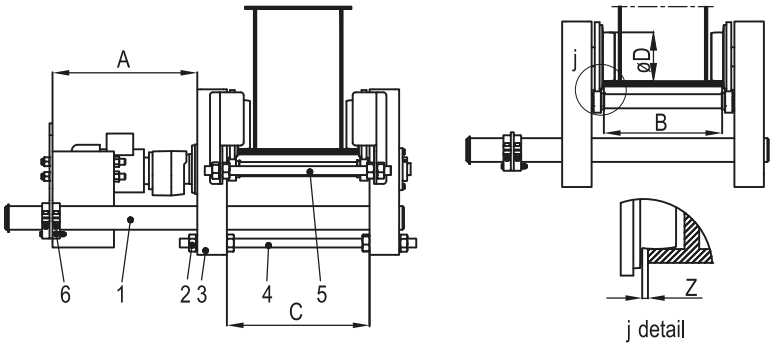
Hoist Type	(1) Hexagon Head Screw		(2) Washer		(3) Hexagon Nut		ød	Torque
	Type	Quantity	Type	Quantity	Type	Quantity	(mm)	(Nm)
GMD 20	M12 x 50	12	A 12,5	12	M12	12	ø12,5	85
GMD 30	M12 x 50	12	A 12,5	12	M12	12	ø12,5	85
GMD 40	M16 x 55	12	A 16,5	12	M16	12	ø17	205
GMD 50	M12 x 55	16	A 12,5	16	M12	16	ø12,5	85
GMD 60	M14 x 55	16	A 14,5	16	M16	16	ø14,5	135
GMD 65	M14 x 55	16	A 14,5	16	M16	16	ø14,5	135

C.2 Monorail hoist

- Monorail wire rope hoist connection position and torque table

  Z: Wheel running clearence is for all machines 3±1mm

1. Profile connection pipe
2. Linkage nut
3. Monorail inter-connection profile
4. Inter-connection shear connector
5. Buffer connection shear connector
6. Pipe flanch

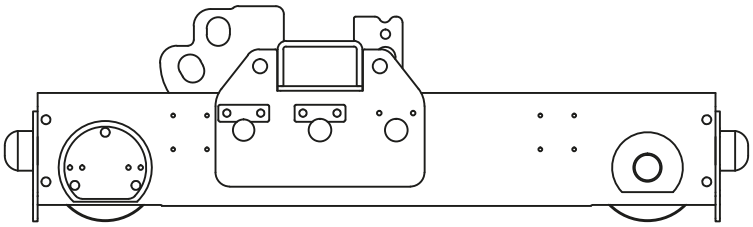


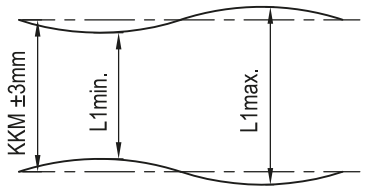
Hoist Type	Bridge Type	B	øD	A	C	Torque
			(mm)			(Nm)
GMD20	BOX GIRDER	300	ø110	580	384	691
	BOX GIRDER	350			434	
	BOX GIRDER	375			459	
	BOX GIRDER	400			484	
	BOX GIRDER	450			534	
	HEA-HEB 200	200			284	
	HEA-HEB 220	220			304	
	HEA-HEB 240	240			324	
	HEA-HEB 260	260			344	
	HEA-HEB 280	280			364	
	HEA-HEB 300-360	300			384	
	IPN 260	113			197	
	IPN 280	119			203	
	IPN 300	125			209	
	IPN 320	131			215	
	IPN 340	137			221	
	IPN 360	143			227	
GMD30	BOX GIRDER	300	ø150	662	384	691
	BOX GIRDER	350			434	
	BOX GIRDER	375			459	
	BOX GIRDER	400			484	
	BOX GIRDER	450			534	
	HEA-HEB 200	200			284	
	HEA-HEB 220	220			304	
	HEA-HEB 240	240			324	
	HEA-HEB 260	260			344	
	HEA-HEB 280	280			364	
	HEA-HEB 300-360	300			384	
	IPN 260	113			197	
	IPN 280	119			203	
	IPN 300	125			209	
	IPN 320	131			215	
	IPN 340	137			221	
	IPN 360	143			227	
GMD40	BOX GIRDER	375	ø165	590	458	1370
	BOX GIRDER	400			483	
	BOX GIRDER	450			533	
	BOX GIRDER	500			583	
	HEA-HEB 260	260			343	
	HEA-HEB 280	280			363	
	HEA-HEB 300 - 650	300			383	
GMD50	BOX GIRDER	500	ø200	500	583	1370

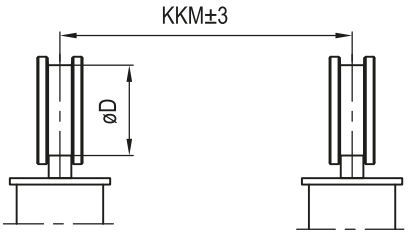
C.3 Double girder hoist

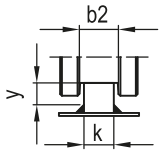
- Double girder wire rope hoist wheel running clearence, rail allowance

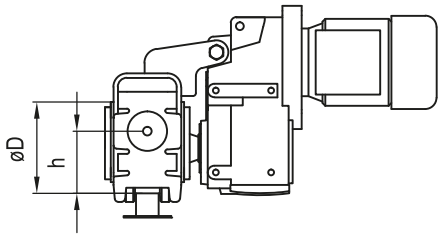
KKM : Trolley gauge
L1max : Maximum trolley gauge
L1min : Minimum trolley cauge
L1max - L1min = 6mm (TS ISO 8336)







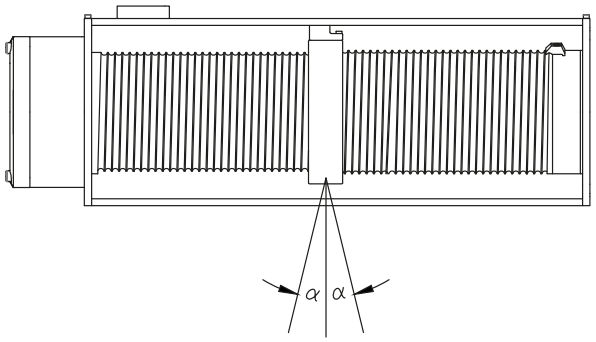




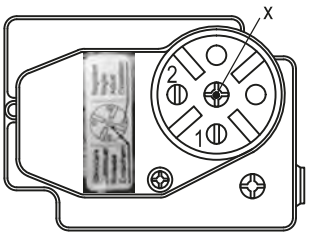
Hoist Type	Hook Reeving	Trolley Endcarriage Type	Wheel Diameter (øD)	Railway Gauge (k)	b2	y	Center of Buffer (h)
			(mm)				
GMD 20 GMD 30	2/1 4/1	TG12	ø125	30 40	40 50	25	105
GMD 40	2/1 4/1	TG16	ø160	30 40	40 50	25	125
GMD 50	2/1 4/1	TG20	ø200	40 50 60	50 60 70	25 25 35	140
GMD 60 GMD 65	2/1	TG16	ø160	30 40	40 50	25	125
	4/1 6/1	TG20	ø200	40 50 60	50 60 70	25 25 35	140
GMD 70	4/1 6/1	TG31	ø315	50 60 70	60 70 80	25 35 35	210
	8/1	TG40	ø400	50 60 70 80	60 70 80 90	25 35 35 45	535

C.4 Wire rope angle

• Maximum permitted wire rope deflection angle between 4° and 1,5°. (DIN15020)
1,5° ≤ α ≤ 4°



•
Wire rope should never rub against hard objects.



C.5 Hoist limit switch

C.5.1 Tour limit switch

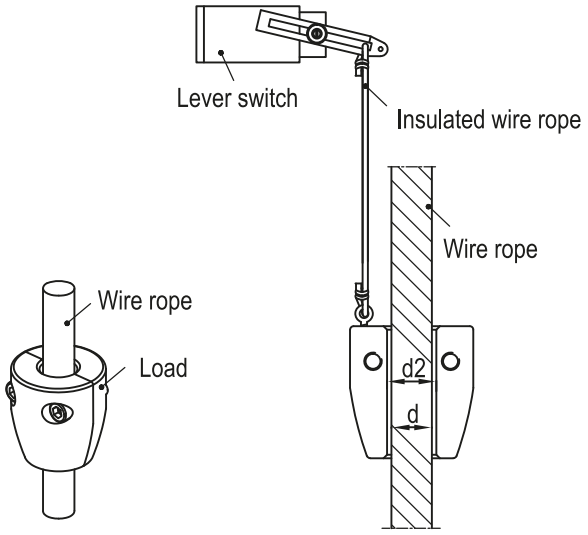
Adjustment

• Open limit switch door.
• 1-2 tour Loosen the bolt which is on the picture.
• Limit switches adjust with no:1 and no:2 screws.
• Turning number 1 screw left or right direction adjusts stopping position of the limit switch door in downward direction.
• Turning number 2 screw left or right direction adjusts stopping position of the limit switch door in upward direction.
• When the adjustments are finished, the bolt (x) on the picture screw again 1-2 tour.

C.5.2 Knob switch

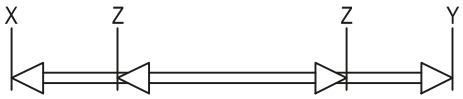
Adjustment

• Second security limit switch. It's used on GMD50, GMD60, GMD65, GMD70.
• The weight is connected to the switch with 30cm long isolated wire rope.
• Inner diameter (d2) should always be bigger than rope diameter(d).
• When hook block touches the weight, hook block forces weight to move upward.Therefore the pulley makes lever switch stop

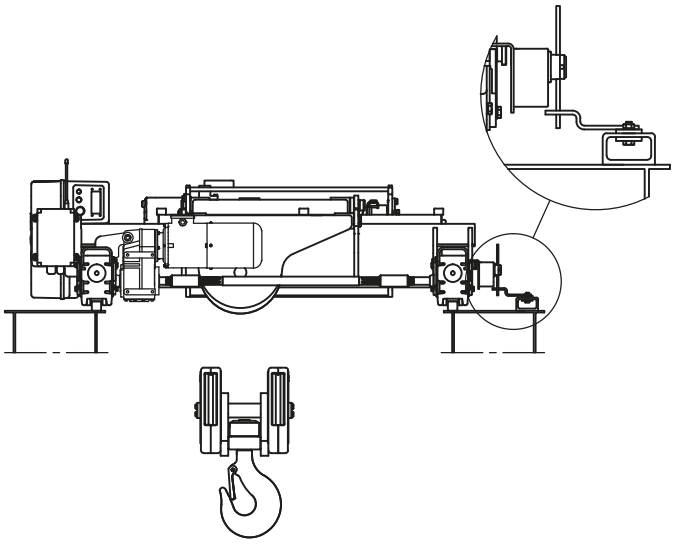


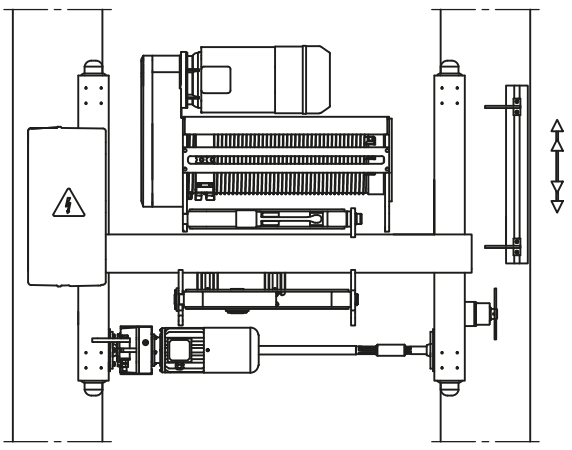
C.6 Trolley limit switches

- Margin switches are used as standard on all machines.
- Limit switch works for both ways. Double staged.
- X : Left stand
  Y : Right stand
  Z : Slow speed

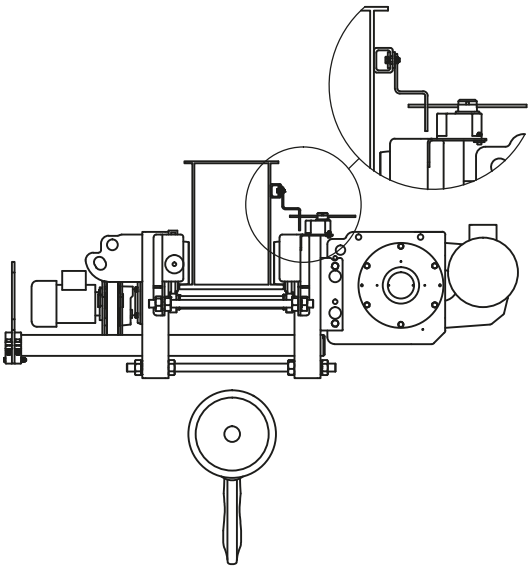


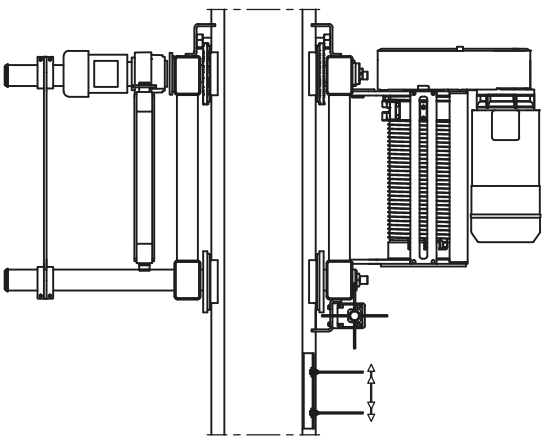
C.6.1 Double girder trolley limit switches





C.6.2 Monorail trolley limit switches





C.7 Electrical connections

For security reasons, the cranes electrical assembly should be carried out by qualified electricians. All connections should be done without power. Relevant safety instructions should be taken seriously.

Main power feeding cable

- Should be used working conditions convenient cable as main power feeding cable.

Cable attachment plug

- All cable connections should be tied firmly.

Fuse switch

- See the table below, fuse rates for stationary wire rope hoist.

Total Engine Power (PT)(kW)	Switch Type	Current Value (Ampere)
$P_T \leq 5,5$	3P	16
$5,5 < P_T \leq 8,5$		25
$8,5 < P_T \leq 13,5$		40
$13,5 < P_T \leq 21$		63
$21 < P_T \leq 29$		80
$29 < P_T \leq 43$		100

Main switch

- During the connections, main switch should be switched off.
- To avoid any work accidents, you should have work safety signs.
- Crane power feeding panel should be easily accessible.
- Working at divided or multi-stored building, systems should have put enough fuse switch disconnector and these switches should be able to stay locked at (OFF)position.

Electromagnetic compatibility

- All electric equipments used at hoist machines are electromagnetically compatible.
- Electromagnetic Compatibility Regulations (2004/108/AT)

Over load switch

- Avoid overload on the system.
- If overload has been determined, the load needs be taken down.
- Switch could only be installed and set at the producer factory.

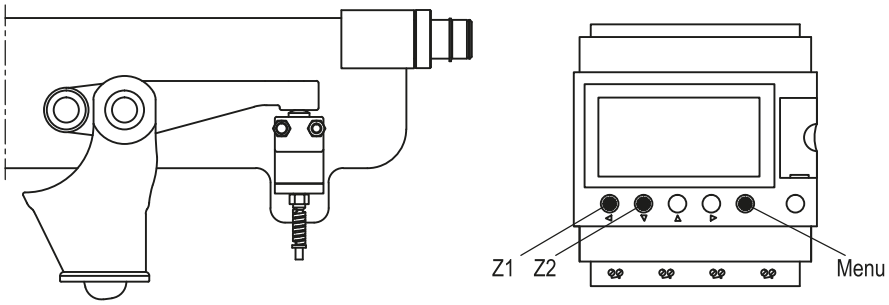
Taking overload switch to test mode

- On PLC (Zelio) press Z1 and Z2 together at the same time 4 seconds to adjust over load's nominal load +41%.
- On PLC (Zelio) screen as long as its seen "Test load active" overload will be disabled.(15minutes)
- When PLC(Zelio) screen is cleared off, system automatically goes back to factory settings.
- This implementation is invalid when there is an external display.

Attention! These processes should be done only during the load test. Apart from over load test, over loading is users responsibility.

Overload calibration

• With electronic overload sensor, Overload switch is set to stop when nominal load + 10 % is reached.



To be wired up

• Connections should be connected according to circuit diagram.
• Compare the mains voltage with the label voltage rate. Measured voltage rate needs to be appropriate to project voltage rate.

Controls by other authorisation outside Guralp

• If electrical connections is not being carried out by Guralp Crane, then it should follow Guralp's electrical wiring diagram.
• CE declaration of conformity is not valid for connections not done by schema

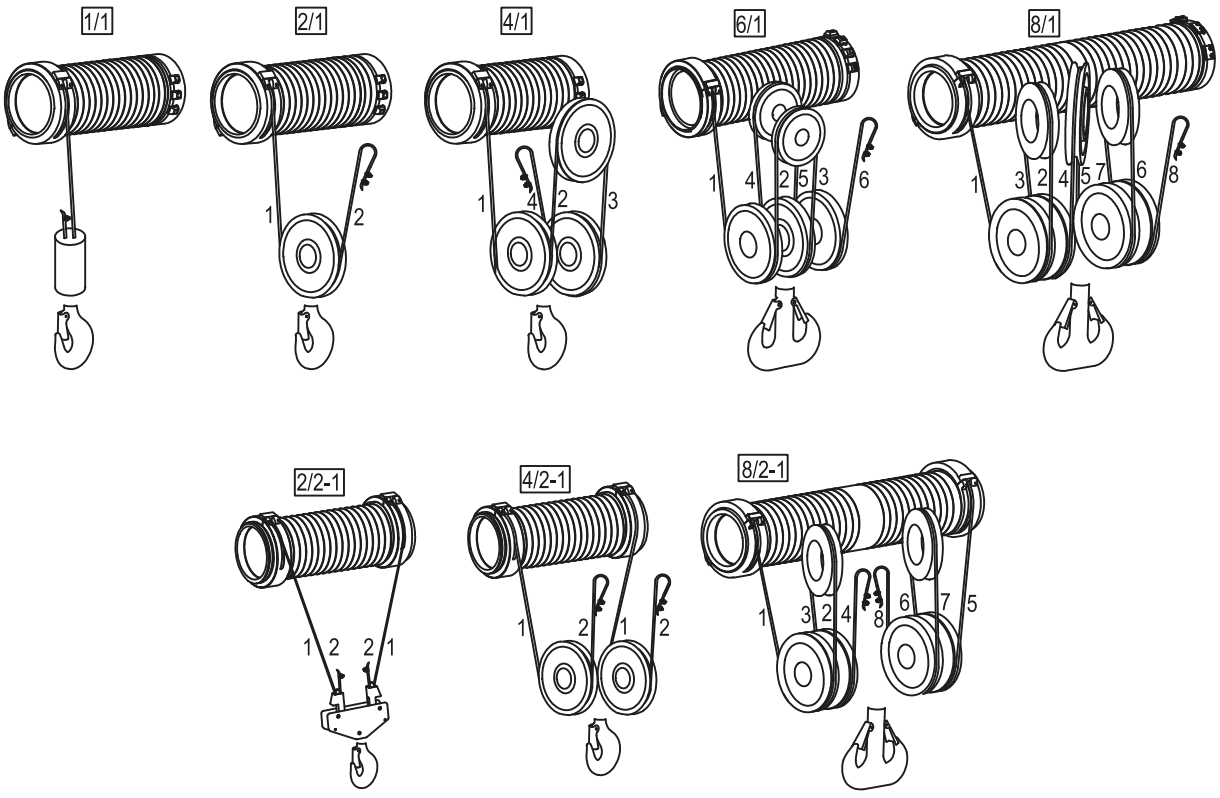
C.8 Rope reeving

Wire rope is wound onto the drum in the factory by following steps below:

- The tip of the wire rope is tied firmly to the drum with clamps which are located upside of the drum (see p.F/11). All the rope should be wound onto drum by laying it out on ground.
- While winding the wire rope, the drum should be working.
- The end part of the wire rope is not wound onto the drum, it is laid out on the ground or hung freely. During this period, the ground should be clean.
- Before winding the wire rope onto drum, check the winding direction of the wire rope. If the winding direction of the wire rope is inapropriate, the wire rope should not be used.
- Check the wire rope is wound onto drum comfortably.
- Reeve the end of the rope into the rope sheaves of bottom hook block and return pulleys. Do not twist the rope.
- Fasten the end of the rope in the rope anchorage.
- Perform several runs over the full height of lift without load.
- Repeat with increasing loads.
- Make any twisting in the rope witch may occur visible by sticking on a paper tag. Severe twisting is shown by the bottom hook block's turning, especially when not under load.
- Any twisting should therefore be removed before subjecting the hoist to any further load. The rope could otherwise be permanently distorted and might have to be replaced.

Hoist Type	Hook Reeving							
GMD20	1/1	2/1	4/1	2/2-1	4/2-1	-	-	-
GMD30	1/1	2/1	4/1	2/2-1	4/2-1	-	-	-
GMD40	1/1	2/1	4/1	2/2-1	4/2-1	-	-	-
GMD50	1/1	2/1	4/1	6/1	8/1	2/2-1	4/2-1	-
GMD60	1/1	2/1	4/1	6/1	8/1	2/2-1	4/2-1	8/2-1
GMD65	1/1	2/1	4/1	6/1	8/1	2/2-1	4/2-1	8/2-1
GMD70	1/1	2/1	4/1	6/1	8/1	2/2-1	4/2-1	8/2-1

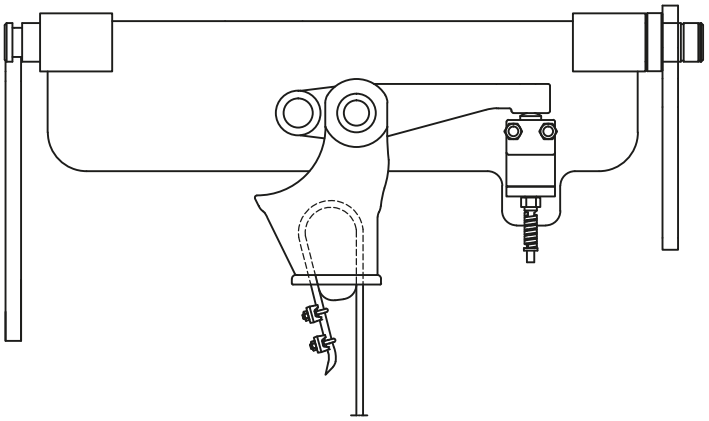
There might be different wire rope equipments for this situation. Check the product guide book with the product.

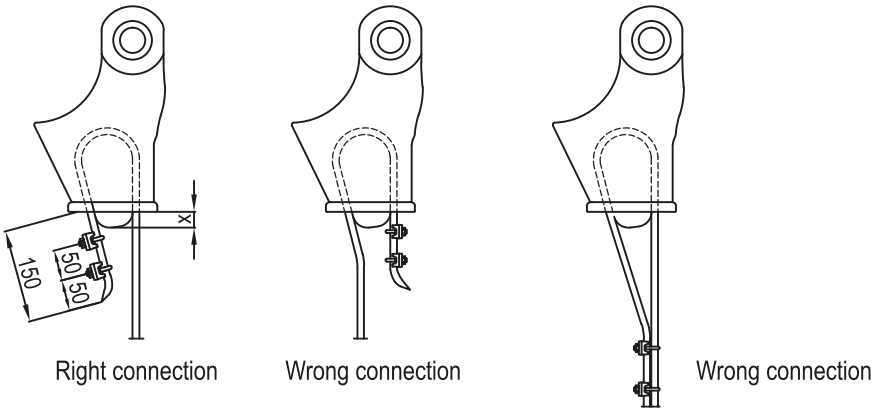


Wire rope immobilization

- Wire rope immobilization information label should be stuck to the suspension systems.
- The end of wire rope is assembled in the rope socket as shown below.
- Wire rope turns around rope wedge and pushes that into the bottom of rope socket.
- At the edge of wire rope leave a 150mm gap. The gap left at the end of wire rope is for security.

Hoist Type	GMD20	GMD30	GMD40	GMD50	GMD60	GMD65	GMD70
X (mm)	6		8		10		25





Right connection Wrong connection Wrong connection

Attention! When the wire rope wedges are lost or damaged, using different methods of manufacturing might cause work accidents. At these situations you need to get the original spare parts from the nearest authorised service

D Commissioning

- Check that the wire rope hoists is completed with the original accessories supplied.(e.g. bottom hook block)
- Check correct selection and installation of all electrical equipment. Check that the seating of fixing screws are firm and secure. (see. p.C/1 - C/2 - C/3)
- Check correct functioning of runway end stops.
- The direction of motion of the load hook must correspond to the symbols on the control pendant (see. p.E/1 - E/2)
- Check the presence and correct functioning of all safety devices.
- Check emergencency hoist limit switch or combined operational and emergency hoist limit switch. (see. p.C/4 - C/5)
- Check over load cut off. (see. p.C/6 - C/7)
- Confirm that commissioning has been duly carried out in the test log book in section “confirmation of commissioning”. (see. p.D/1) (see. p.K/1)
- Run rope in under partial load. (will improve service life) (see. p.F/7)

Attention! Commissioning should be done by qualified staff.

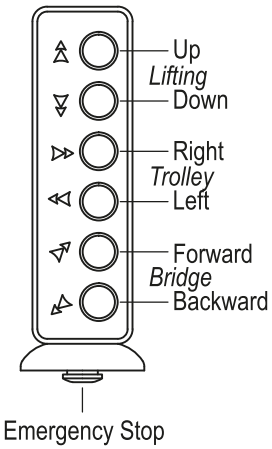
E.1 Crane operators duties

- You can see the safety conditions in article A.5.
- Everyday before starting operations, check breaks, limit switches and inspect to system to see if there is any defects.
- If there is any defects seen during the work, for safety stop the crane.
- Do not move loads above people.
- Control actuator should be located at easy accessible places.
- Do not leave suspended load unattended.
- Do not use emergency limit switch during the operation.
- Crane should not exceed loaded over rated capacity.
- Pulling the loads at angles, dragging loads or towing vehicles with the load or load suspension equipment is forbidden.
- Do not lift any jammed load up.
- Do not lift the load up with an impulse. Pulsed movement is not permitted case. Motor and break gets too hot and motor might get damage.
- Do not move crane in the opposite direction until the hoist has come to a stop.
- Wire rope safety latch itself/working should be checked.
- Do the general wire rope check(wiring, twisting etc.)

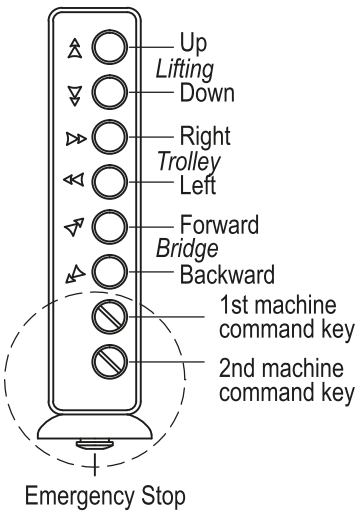
E.2 Control Button

E.2.1 Control Button

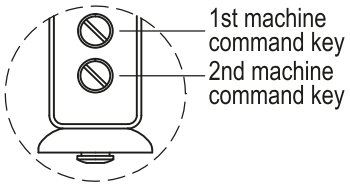
- All buttons have two stages.



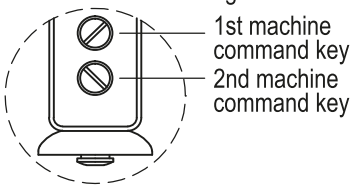
E.2.2 Synchronous mobile pendant



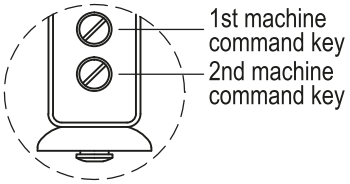
Machine command keys are off:
Both machines do not work



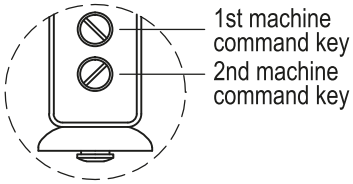
1st machine command key is on:
1st machine is working



Both of the command keys are open:
Both machines are working in a syncronized way.

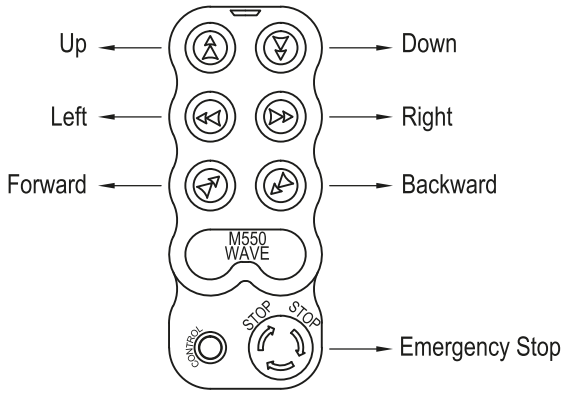


2nd machine command key is on:
2nd machine is working

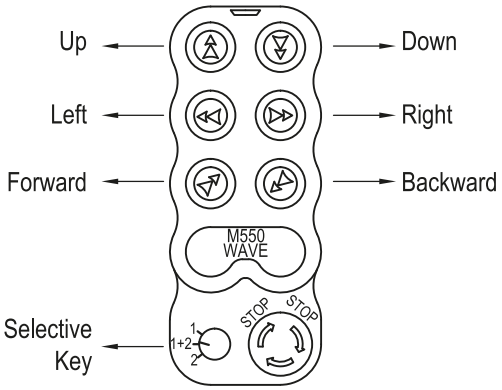


E.3 Remote control

E.3.1 Radio remote control



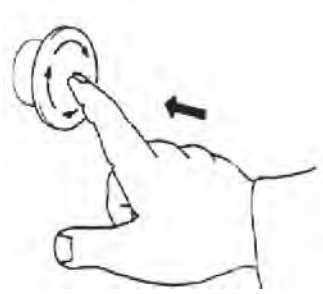
E.3.2 Synchronous mobile pendant



When selector switch is at position 1 : 1st machine works.
When selector switch is at position 2 : 2nd machine works.
When the switch at 1+2 : 1st and 2nd machines work together.

E.4 Emergency stop

- You can see the safety precaution at Article A.5.
- Emergency stop button is on the control pendant.
- Pressing emergency stop makes system stop immediately.
- To release the emergeceny stop button, turn the button in clockwise direction. (see the picture below)



Emergency stop energy cutting

Emergency stop energy release.

General information about control and maintenance

- Maintenance and repair should be done when crane is unloaded.
- Before starting, switch off and lock main isolater. Put some related signs on switch and crane to prevent accidents.
- Work safety precaution should be taken serious.
- Periodic controls should be carried out at least once a year. Every company should carry out risk analysis to specify safety working regulation periodically. Periodic test utilization specified by frequency of occurrence.
- Signified maintenance and control range is valid for normal usage. If any of these happen below then maintenance and control ranges should be more frequent:
  - If crane has less than 10 years life time left after theoretically calculation,
  - In the case of operation in more than one shift or heavy duty,
  - In the case of negative environment conditions (acid, hot wheather, dust),

A general overhaul must be carried out after the useful lifetime has expired.

During the maintenance conditions to take into consideration

- Before starting the maintenance check, the main power for crane should be off. During the maintenance leave some signs to keep the power off position.
- If maintenance team are on the bridge, crane should be surrounded by safety strip to warn danger of falling materials.
- If there is more than one crane in the same hallway, take steps to avoid any accidents at work place.
- During maintenance, maintenance personnel should not touch to any resistance system at crane.

- If welding is needed during maintenance, welding machine chassis pliers should be attached to cranes wire ropes.
- When maintenance checks are finished, crane control panel doors should not be left open.
- When maintenance checks are finished, maintenance personnel need to make sure that no materials are left on the crane. (Wrench, flush cutter, grease cup etc.)

F.1 Control intervals

- No. 6331 Work Equipment Operating in the Health and Safety Regulations and business equipment repair, maintenance and periodic inspections of the relevant national and international standards at specified intervals and in the criteria, manufacturer's data with the science and technique requirements is done considering. Periodically control range and criteria determined by the standard of work equipment periodic checks, if any, as stipulated control range and criteria is done by the manufacturer.
  If this considerations are not determined by the manufacturer, time periods of periodic controls of the machine is determined by risk assesment regarding workplace conditions, frequency of use and lifetime factors. Periodic inspection interval specified exceptions specified in these regulations should not exceed one year

Every business should determine the periodic test time according to working period and frequency of use by carrying out risk analysis!

Lifting the machine needs maintenance practices, despite the parts subject to wear, it should be checked regularly. These audits should be carried out by qualified person!

If users make their own case of audit, every audit needs to be written and recorded and required to send a copy of record by e-mail or fax.

F.1.1 Daily basis

Before starting work, the below needs to be carried out to ensure that everything is in working order.

- Check break functions
- Control buttons with direction arrows to match the crane movements
- Emergency stop button
- Crane up-down limit switch
- Trolley left-right limit switch
- Hook safety latches
- 360° Reversibility of hooks beak
- Wire rope wear and fractures

F.1.2 Once a year

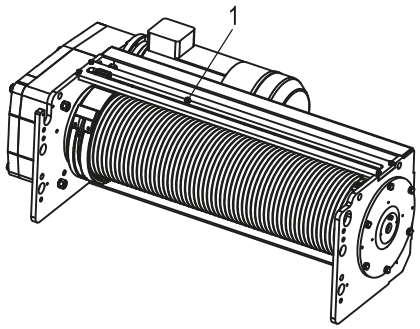
Checks to be made once a year;

- First checks should be made daily
- Overload limit switch (see p.C/6 - C/7)
- Break running clearence value (see p.F/4 - F/5)
- Hook beak size and recording (see p. F/14)
- Cracks, wear, cold deformation at hook
- Machine components connections(bolt, welding, gudgeon, lock etc)
- All locking functions
- Wire rope general control, wear, fractures (see p.F/7 - F/8 - F/9)
- Fixing wire ropes(see p.C/9)
- Drum wear
- Wire rope clamps (see p.F/11)
- Rope pulley wears (see p. F/12)
- Lubricating reductors (see p.H/2)
- At gears and moving parts mechanical sounds and jams
- Wheels and rails (see p.F/13)
- Mechanic stopper and buffer (see p. C/3)
- All electrical wiring, fittings, connections and grounding
- All machines ID label information
- Control buttons, wiring, steel wire tension (see p.E/1 - E/2)
- General cleaning
- Crane load test (see p. F/6)

F.2 Maintenance interval

F.2.1 Once a year

- Measure air gap on the break and if necessary, change the brake disc
- Check overload limit switch
- Lubricate wire rope and wire rope guide with a brush
- Check electrical wiring and fittings and tightened them
- Check machine connection components (bolt, welding, gudgeon etc.)
- Check all locking functions control (wire rope lugs, segment, spindle lock, wire rope wedge etc.)
- Also, check wheels, pulley, drum grooves, guiderouting element (1) and wear



- Lubrication of bearings (see p. H/2)
- Safety working period should be determined. (see p.F/14)

Warning! For lubrication periods should be determined shown at the additional chart. (see p.H/2)

For control a maintenance please see page L/1.

F.3 Hoisting limit switch

System description

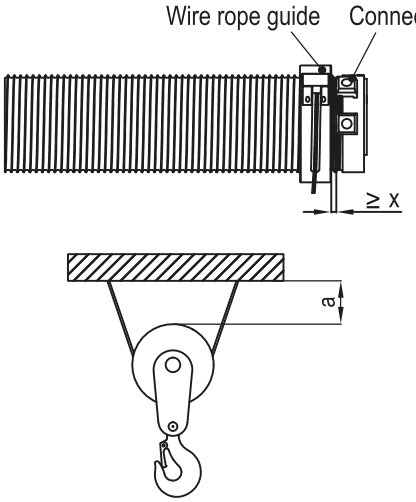
- Steel wire rope lifting machines, lifting and lowering movements of upper and lower limits of the hook used to provide stand.
- Switch, when it comes to the upper and lower set point automatically cut off the electric to stop movements of the drum.

Attention! Limit switch settings of the machine is set within the specified operating limits.If it is not used by this manual, might occur some problems.

Testing of hoist limit switch

- Test without load at speed 1 and speed 2 stages.
- Carefully activate the “up button” on the control pendant, observing the hoisting motion, until the limit switch disconnects in top hook position.
- When setting switch hook block, the minimum clearance(a)between the nearest obstacle see the table below.
- Press the down button and move up till switch cuts it off.
- The distance between wire rope guide and connection clamp is (x) mm.

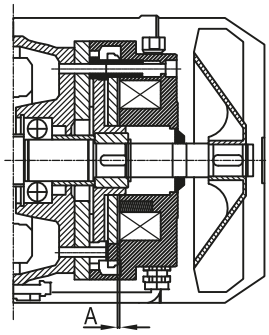
Attention! Using a screwdriver, adjust the limit switches without using excessive force.



Hoist Type	a (mm)				x (mm)
	2/1	4/1	6/1	8/1	
GMD20	50	65	-	-	10
GMD30	210	100	-	-	10
GMD40	110	50	-	-	10
GMD50	100	100	-	-	12
GMD60	140	75	140	-	10
GMD65	140	75	140	-	12
GMD70	-	190	210	220	6

F.4 Hoist motor break

- During the break checks the crane should be unloaded and the weight of the hook block should be taken.



Hoist Type	GMD20	GMD30	GMD40-50	GMD60	GMD70
Break Type	ZBF40	ZBF60	ZBF100	ZBF155	ZBF252
	(mm)				
A (*1)	0,3	0,4	0,4	0,4	0,4
$A_{max.}$	0,9	1,0	1,1	1,2	1,3
Max. stroke	0,9	1,0	1,1	1,2	1,3
Break disc min. thickness	9,5	11,5	12	14	14

(*1): The gap between coil and disc

F.4.1 Break control

- Remove the fan cover.
- Disconnect the eletrical connections.
- Measure the gap between the brake disc and the brake coil.Compare them with the table values. If the value has reached to maximum value, replace the brake disc and brake pads.

F.4.2 Changing the break disc and break pad

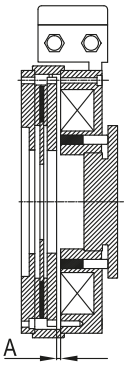
- Remove the fan cover.
- Remove the cooling fan.
- Disconnect all electrical connections.
- Remove the break mounting bolt. Disassemble the break block from the engine.
- Remove the break disc and change it with original spare part.
- Remove the break pad and change it with original spare part.
- Make the required adjustments according to measurements given at the table.
- Re-fit the break. Bolt and connect all electrical connections.
- Insert the cooling fan.
- Insert the break cover.

Attention! After each process is performed on the break, carry out a load test.

Attention! There is a fan located at hoisting, trolley motor, and brake groups to cool the engine.
If engine is running at lower speed than the rated speed, in addition to the further cooling of the engine, external fan is required

F.5 Trolley motor break

- During the break control, unload the crane.



Break Type	NFX
	(mm)
A (*1)	0,5
$A_{max.}$	1

(*1): The gap between coil and disc

F.5.1 Break control

- Remove fan cover.
- Disconnect the electrical connections.
- Measure the gap between break disc and break coil. Compare the measurements with the values on the table. If the value has reached to the maximum value, change the break disc and break pad.

F.5.2 Changing the break disc and break pad

- Remove fan cover.
- Remove the cooling fan.
- Disconnect the electrical connections.
- Remove the break mounting bolt and disassemble the break block from the engine.
- Remove break disc, replace it with original spare part.
- Remove break pads, replace it with original spare parts.
- Carry out the required adjustments according to the measurements given in table.
- Re-fit the break. Bolt and connect all electrical connections.
- Insert the cooling fan.
- Insert the break cover.

Attention! After each test is performed on the break, carry out the load test.

Attention! There is a fan located at hoisting, trolley motor and brake groups to cool the engine.
If engine is running at lower speed than the rated speed, in addition to the further cooling of the engine, external fan is required.

F.6 Crane load test

- Test loads should be as specified in contract or purchase order requirements.

Static test

- Static tests, should be done above floor 100mm to 200mm, with 125% over capacity.
- Crane should be tested with inconvenient load combinations that signified for crane mechanism.
- Test load applied for a time period to see measurements and observations about crane sufficency capacity.
  If there is nothing seen such as: cracks, deformation, loose or damage parts, the test is done successfully.

Dynamic test

- Dynamic experiments should be done 110% above the capacity that signified on the contract.
- During these tests crane should be watched all the time to control below stated:
  - Proper operation of the crane.
  - Effective operation of the break systems.
  - Working right and the effectiveness of margin and indicator assembly.
  - Hoist machine electrical current is scaled to marking plate or manufacturer's values.
- Limiting capacity should be tried with a mass between 110 % and 125 % of declared capacity as stated on the contract, protection of performance signified as below.
  - Hoisting elements lift is starts without being exposed to stretch.
  - In this case the maximum speed allowed by control system.
  - Hoisting elements are operated till the limit of the capacity which is stated in the convention
- Dynamic tests are accepted successful when there is no loose or damaged parts.

2006/42/AT Machine Safety
Number 6331, In the use of work equipments Health and Safety Regulations

TS EN 15011 Şubat 2012 Cranes-Bridge and Portal Cranes
TS 10116-April 1992 Hoist and Carrying Machines-Cranes-Inspection and Test Methods TS 10116-Nisan 1992

F.7 Wire rope

F.7.1 Wire rope and wire rope connections

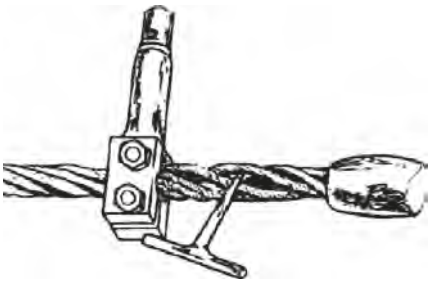
- When wire rope is first wrapped to drum or when wire rope is changed might occur some twists. Please remove these twists.
- Please regularly check the wire rope twists, to do this, run the rope hook up and down unloaded. If there are any twists unfasten it.
- Check the wire rope oftenly, especially check the parts inside the rope pulley. If there is any damage or wear, change the wire rope.
- If there are too many broken wires on the wire rope, change the wire rope. (see p. F/8)
- Corrosion and wear causes a decrease in rope diameter. When corrosion is detected that diameter gets smaller, and rope should be replaced.
- Faulty due to the winding knot, kink, twist or other mechanical damage may ocur. If this deformation is detected, replace the rope.

Parts control related with wire rope

- Check that pulleys are rotating freely.
- Change worn wire rope slot if it is worn. Worn wire rope slot and jammed wire rope cause limited bundle and wire movement, and it reduces the bending capacity. Also, it affects the wire performance (see p.F/12)

Cutting the rope

- When it is necessary to cut the wire rope, use safety handles on both sides.
- Length of safety handles for stranded wire ropes should be at least double length of wire rope's diameter.
- To cut the wire rope preferably use spiral stone. Also, mechanic or hydraulic cutting equipments can be used.
- If the wire rope end is not secured after cutting it, it might cause a loosened and broken rope.



At wire rope end, wire rope is not tense by connection point.

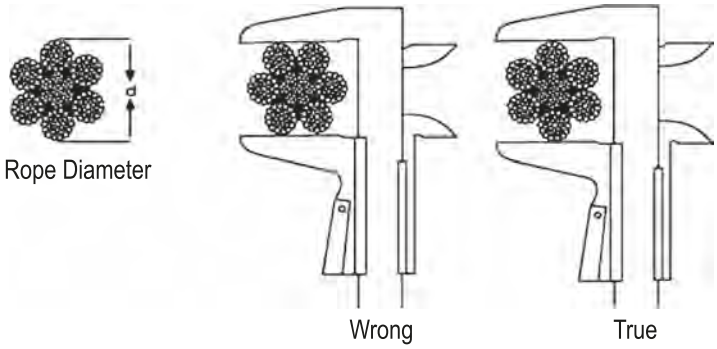
Starting to work with new wire rope

- New wire rope and equipments should run several cycles with slow and low load. This provides the wire rope to gradually adjust itself.
- Before wire rope begins it should never work with full load or overload.
- Irregular wrap cause serious wear on level and wire rope.

Lubrication of wire rope

- If wire ropes are not lubricated at the appropriate times, it may cause low performance and unexpected corrosion.
- Over lubrication or wrong lubrication can cause foreign materials to build up on wire rope.This might occur some corrosion at wire rope, drum and pulley.
- Implementation could be done by brush, dripping feed, portable pressure spray and high pressure.
- For lubrication and maintenance period (see p. H/2)

Wire rope diameter measurement



F.7.2 Wire ropes inspection and discard

F.7.2.1 Wire ropes inspection

- During the inspection all visible parts of wire rope needs to be checked daily. General failures and deformations needs to be determined.
- Taking care of moving and stable wire ropes end points, wire ropes parts go inside pulley, wire ropes parts go over pulley.
- During the inspection of wire ropes it is necessary to be determined that if there is any corrosion or fatigue in inner inspection.
- Any color change needs to be determined at wire ropes parts that are exposed to heat.

F.7.2.2 Discard criteria of wire ropes

The conditions and the number of broken wire ropes (*TS ISO 4349*)

Hoist Type	Stock Code	Rope Type	Number of broken wire which can be seen appearently and can make crane stop.			
			1Bm(M3), 1Am(M4) Transverse Wraparound		2m(M5), 3m(M6) Transverse Wraparound	
			6d	30d	6d	30d
GMD20	IM.GM.HAL.0041	8 6x19 S - NFC 1960 U sZ	3	6	6	12
GMD30	IM.GM.HAL.0027	10 6x36WS - NFC 1960 U sZ	3	6	6	12
GMD40	IM.GM.HAL.0008	14 6x36WS - IWRC 1960 U sZ	7	14	14	29
GMD50	IM.GM.HAL.0061	16 6x36WS - IWRC 1960 U sZ	7	14	14	29
GMD60	IM.GM.HAL.0013	18 6x36WS - IWRC 1960 U sZ	7	14	14	29
GMD65	IM.GM.HAL.0013	18 6x36WS - IWRC 1960 U sZ	7	14	14	29
GMD65	IM.GM.HAL.0094	20 6x36WS - IWRC 1960 U sZ	7	14	14	29
GMD70	IM.GM.HAL.0019	24 6x36WS - IWRC 1960 U sZ	7	14	14	29

d= rope diameter

An Example: Rope diameters is 10 mm. working class is 2 m. also the rope is cross wrap; from the table in 6d=6x10=60 mm. length rope if there is 6 or more broken wires rope must be out of service. Also, in 30d=30x10=300 mm. length rope, if there is 12 or more broken wires rope must be out of service.

Attention! When wrapped wire rope can not be removed totally, even amount of the broken wire is not the below that is given on the table, it still needs to be changed.

Broken wires at connecting terminals
• Caused by high tension and wrongly connected terminals. Needs to be re-done by connecting the terminals.

Group of broken wires at some places
• If wire breakage is shorter than 6d or concentrate in a bundle, number of broken wires even less than maximum value which is given on the table above, wire rope should be left out of service.

Broken wires raising rate
• The main reason for broken wire ropes is fatigue. After a while the amount of broken wires will raise. Record amount of broken wires raising ratio.

Sheave breakage
• If there is a sheave breakage, wire rope needs to be taken out of service.

Shrink of wire ropes diameter
• Occured by wire ropes inner corrosion, pounding, bending exposure, broken core, shear off core and shear off inner levels.

External corrosion
• Occured by lack of lubrication or wrong lubrication, it reduces cross sectional area. If wire ropes main diameter's 7% or more reduces, it will need to be taken out of service.

Decreased elasticity
• Shrink off wire rope diameters, wire rope winding lengthen, the loss of space between wires and rope sheave, apperance of some brown dust on between outside rope sheaves, cause reduced elasticity and harden wire rope.

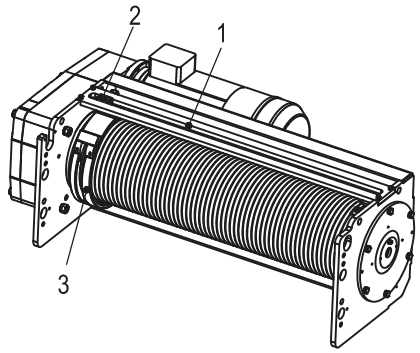
External and internal corosion
• External wires corrosion can be determined by eyes. Internal corrosion is harder to determine. Changes on the wire ropes diameter, Visible broken wires between bundles space is a sign of internal corrosion. If there is any of these signs, wire rope will need to have internal inspection. Two suitable size clamps tight to each other, and apply opposite way force to wire ropes winding to split external rope sheaves up. If there is any internal corrosion wire rope should be left out of service.

Deformation
• Determined any deformation at the appearance. Might cause spreading the tension irregularly. Twists, stretched knot, wire exposure, bigger diameter are only some of the signs for deformation.

Damage by heat or electricity arch
• Wire ropes surfaces colored by thermal effect, should be left out of service.

F.7.3 Disassemble of wire rope guide

- First guide path(1) needs to be removed.
- Gridholder parts(2) removed.
- Thus wire rope guide(3) turns itself freely.
- Wire rope guide, screws and pressure spring dismantle and seperated to two. (see p. 6.11)
- Finally, guide spring removed. (see p. 6.11)



F.7.4 Changing the wire rope

- Use only wire ropes that technically specified by manufacturer company. When changing the wire rope, it is necessary to use the wire ropes which producer company technically specified.
  - There are two types of wire rope winding conditions:
  - Right wire rope, to left chanelled drum.
  - Left wire rope, wrapped to right chanelled drum.

Attention! Whenever wire rope is changed, wire rope guide spring needs to be changed too.

Unwrapping the wire rope from the drum

- Hoist machine runs downstream till bottom switch limit stops to machine. Hook weight is taken of wire rope.
- Wire rope wedge is taken off and wire rope is released.
- Pull the wire rope carefully through pulley manually.
- To open the wire rope, bottom limit switch needs to run opposite way as it is explained at page 13.

Attention! As soon as a new wire rope is wrapped to the drum, do not forget to bring limit switch to the original position.

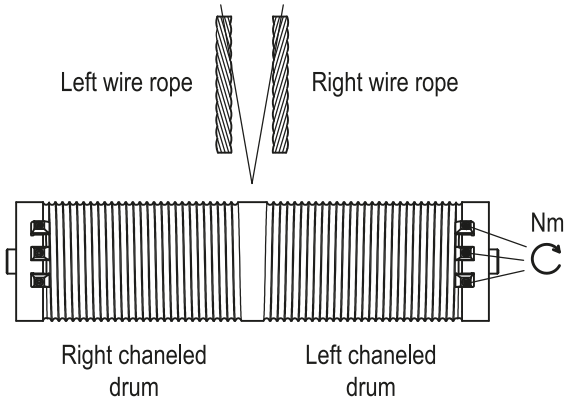
- By unscrewing the wire rope, clamp bolts on drum, wire rope is seperated from drum.

Wrapping wire rope to drum

- Wire rope needs to be opened properly to somewhere clean without bending, twisting, folding. Wire rope needs to be protect from dust and dirt.
- Run the drum and lubricate the wire rope channels.
- Tie wire rope to the drum with wire rope clamps. On the first wire rope clamp connection leave 30 mm at the end of wire rope.
- Wrap wire rope to the drum about 8-10 groove and assemble the wire rope guide.
- When tightening the connection bolts, press the tightening torque button.
- Run the wire rope with a light weight load.

Attention! Adjust the hoist limit switch for both ways again.

- When new wire rope is replaced or some adjustments are done on the old wire rope, make adjustments on limit switch. If wire rope gets twisted during the operation it will need to be straightened.



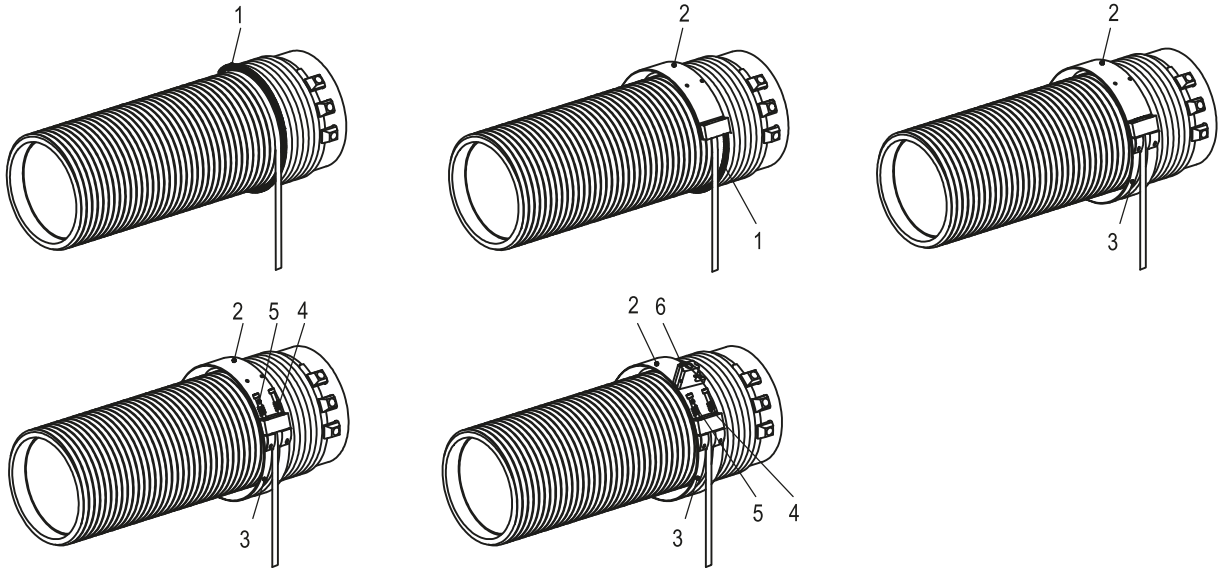
Hoist Type	Allen Head Bolts	Torque (Nm)
GMD 20	M6 x 20	13
GMD 30	M8 x 20	33
GMD 40	M10 x 30	66
GMD 50	M12 x 40	85
GMD 60	M12 x 40	85
GMD 65	M12 x 40	85
GMD 70	M12 x 40	85

F.7.5 Assemble of wire rope guide

- Lubricate the wire rope guide grooves with grease. Assemble spring guide(1) on the wire rope which is already on the drum
- Assemble guide top part(2) on the drum.
- To assemble guide bottom part (3) under the drum use the connection bolts(5) pressure spring(4).
- Wire rope guide needs to touch the drum softly and needs to be rotatable by hand easily.
- Assemble the wire rope guide holder part (6) on the wire rope guide.
- Finally, assemble guide path forming member which is a part of body group member.

Attention! If wire rope guide is not assembled correctly to the drum, then drum might get damaged.

Hoist Type	Wire Rope Guide Spring (1)	Pressure Spring (4)	Allen Head Bolts (5)
GMD 20	ø1,6 x ø6 x 455	ø1,4 x ø10,5 x 10	M6 x 30
GMD 30	ø1,9 x ø8 x 710	ø1,4 x ø10,5 x 10	M6 x 30
GMD 40	ø2,5 x ø10 x 875	ø2,8 x ø14 x 20	M8 x 50
GMD 50	ø2,8 x ø12 x 930	ø2,8 x ø14 x 20	M8 x 60
GMD 60	ø2,8 x ø14 x 1140	ø2,8 x ø14 x 20	M8 x 60
GMD 65	ø2,8 x ø14 x 1050	ø2,8 x ø14 x 20	M8 x 60
GMD 70	ø2,8 x ø14 x 1285	ø2,8 x ø16,1 x 20,2	M8 x 50

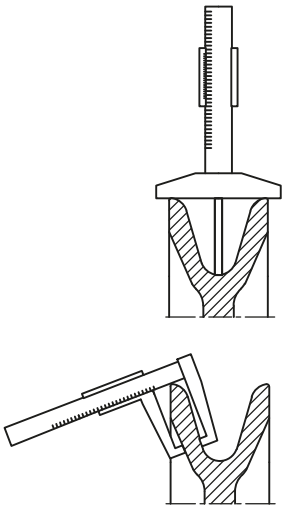


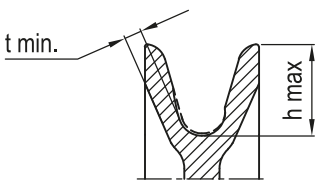
F.7.6 Wire rope pulley inspection and maintenance

- Wire rope pulley corrosion needs to be checked. This check needs to be done by trained or qualified member of staff.
- Corrosion margin on the wire rope pulley needs to be checked. If the measured thickness of the wall is less than t or measured depth of the drain is higher than h, wire rope pulley must be changed immediately.
- If wire rope caused some damage on the drum groove, rope drum needs replacing too.
- Using worn or old wires cause reduced diameter.

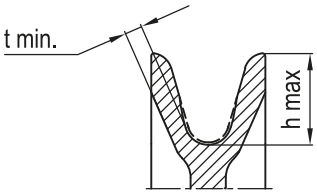
Attention! Check hook block. Deformations, cracks and cuts should be evaluated by qualified person.

Hoist Type	Hook Pulley Diameter ØD	Stock Code	t min	h max	R	Rope Reving	Hook Type
	(mm)						
GMD20	160	IM.HM.DOK.0110	4	18	4	2/1	Nr 1,6
						4/1	
GMD30	205	IM.HM.DOK.0112	5,7	23	5,5	2/1	Nr 1,6
						4/1	Nr 4
GMD40	280	IM.HM.DOK.0115	6	27,5	8	2/1	Nr 4
						4/1	Nr 6
GMD50	330	IM.HM.DOK.0116	7	32	8,5	2/1	Nr 4
						4/1	Nr 8
GMD60 GMD65	360	IM.HM.DOK.0117	7	37	11	2/1	Nr 6
						4/1	Nr 12
						6/1	Nr 16
GMD70	440	IM.HM.DOK.0118	11	39	12	4/1	Nr 20
						6/1	Nr 25
						8/1	Nr 40

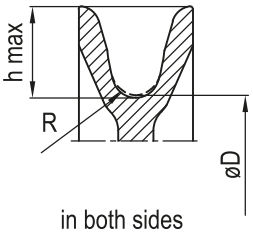




in one side and on sole



in both sides



in both sides

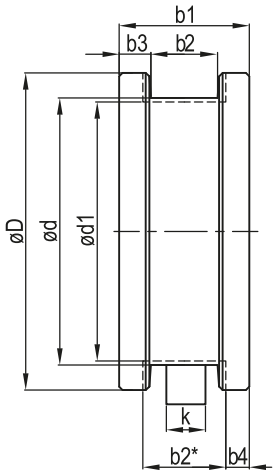
F.8 Double girder and monorail machine wheels

- Visiual inspection of wheels for wear. See the tables for wear limits.
- Visiual inpection of wheel for flanges for wear.

Attention! When wheels reached to wear limit, must be replaced urgently.

F.8.1 Criterias of disposal for double girder trolley wheels

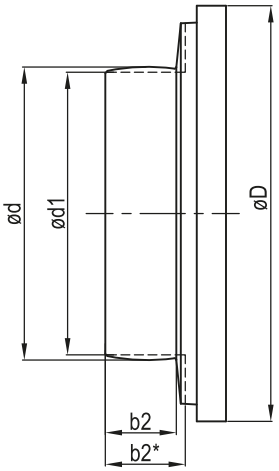
Hoist Type	Wheel Type	Stock Code	Rope Reeving	ød	k	b2	b1	b3	øD	ød1	b4	b2*
				(mm)								
GMD 20	Idle Driven	IM.HM.DOK.0170 IM.HM.DOK.0147	2/1 4/1	125	30	40	80	20	150	118,8	7	53
GMD 30	Idle Driven	IM.HM.DOK.0170 IM.HM.DOK.0147	2/1 4/1	125	30	40	80	20	150	118,8	7	53
GMD 40	Idle Driven	IM.HM.DOK.0171 IM.HM.DOK.0148	2/1	160	30	40	80	20	190	152	8	54
					40	50		15			13,5	66
			4/1		30	40		20			8	54
					40	50		15			13,5	66
GMD 50	Idle Driven	IM.HM.DOK.0172 IM.HM.DOK.0149	2/1	200	40	55	100	22,5	230	190	10,5	73
					50	65		17,5				83
			4/1		40	55		22,5				73
					50	65		17,5				83
GMD 60 GMD 65	Idle Driven	IM.HM.DOK.0171 IM.HM.DOK.0148	2/1	160	30	40	80	20	190	152	8	54
					40	50		15			13,5	66
		IM.HM.DOK.0172 IM.HM.DOK.0149	4/1	200	40	55	100	22,5	230	190	10,5	73
					50	65		17,5				83
			6/1		40	55		22,5				73
					50	65		17,5				83
GMD 70	Idle Driven	IM.HM.DOK.0173 IM.HM.DOK.0150	4/1	315	50	70	115	22,5	350	300	13,5	88
					60	80		17,5				98
	Idle Driven	IM.HM.DOK.0174 IM.HM.DOK.0151	6/1		50	70		22,5				88
					60	80		17,5				98
			8/1	400	50	70	135	32,5	435	385	16	90
					60	80		27,5				100



d1 : Permitted worn wheel diameter
b2* : Permitted wheel working space

F.8.2 Criterias of disposal for monorail trolley wheels

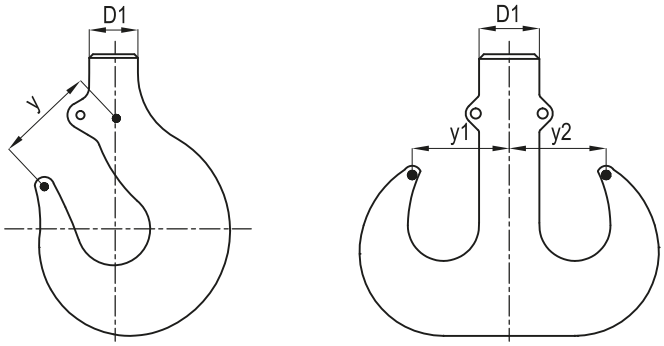
Hoist Type	Stock Code	øD	ød	b2	ød1	b2*
		(mm)				
GMD 20	IM.HM.DOK.0168	187	110	26	105	28
GMD 30	IM.HM.DOK.0167	223	150	30	143	32
GMD 40	IM.HM.DOK.7015	234	165	40	154	43
GMD 50	IM.HM.DOK.0165	245	200	32	190	34



d1 : Permitted worn wheel diameter
b2* : Permitted wheel working space

F.9 Criterias of disposal for hooks

- Yearly check hook beaks ring gap, measure and compare with the table and record.
- Change the hook if "y" has changed more than 10% according to DIN 15400.



Hoist Type	Rope Reeving	DIN 15401 Single Head	DIN 15402 Double Head	DIN 15400 Material Class	D1	y	y1	y2
					(mm)			
GMD 20	2/1	Nr. 1,6	-	S	36	80	-	-
	4/1		-		-	-	-	-
GMD 30	2/1	Nr. 1,6	-	S	36	80	-	-
	4/1	Nr. 4	-		48	100	-	-
GMD 40	2/1	Nr. 4	-	S	48	100	-	-
	4/1	Nr. 6	-		60	130	-	-
GMD 50	2/1	Nr. 4	-	S	48	100	-	-
	4/1	Nr. 8	-		67	145	-	-
GMD 60	2/1	Nr. 6	-	S	60	130	-	-
	4/1	Nr. 12	-		85	180	-	-
	6/1	-	Nr. 16		95	-	148,5	148,5
GMD 65	2/1	Nr. 6	-	S	60	130	-	-
	4/1	Nr. 12	-		85	180	-	-
	6/1	-	Nr. 16		95	-	148,5	148,5
GMD 70	4/1	Nr. 20	Nr. 20	S	106	255	165,5	165,5
	6/1	Nr. 25	Nr. 25		118	255	185	185
	8/1	Nr. 40	Nr. 40		150	320	233	233

F.10 Safety working period

- Wire rope hoist machines are classified according to FEM 9.511.
- According to FEM 9.755, working life time is determined and remaining service life is recorded.
- Machines safety working time could be read on PLC. Press on Z1 button, to see working time on the right bottom of the screen. Its calculated according to safety working period mechanism class.
- When machine completes 90% of safety working period, needs to be planned the general revision.
- General revision definitely needs to be done by manufacturer company.(FEM 9.755)
- After every general revision manufacturer company specify new safety working period.

Theoretically remaining life for service.

Mechanism Class	1 Dm	1 Cm	1Bm	1 Am	2m	3m	4m	5m
	M1	M2	M3	M4	M5	M6	M7	M8
Time left (h)	100	200	400	800	1600	3200	6300	12500

G.1 Potential failure and solutions

Failure	Reason	Troubleshooting
Crane is not operating	No power	Check main energy cables' connections, switches, and cut off switches.
	Phase sequence is wrong / Loss of phase	Change any 2 of the 3 energy feeding connection points of the phase. Check are there any lost phase or not. If there is any neutral line, check the line.
	Emergency stop button is off	Emergency stop must be on. Or the connections must be checked.
	Problem in conductor line	Check the connections of current receiver and current reciever coal in the connector line. Change the connector line if there is any broken line or corresion on the line. Check the tension of connector line.If it is not tight make the connector lines tight
Crane movement directions (down-up, left-right,foward-backward) not working.	Tripped circuit breaker	Check the engine protection switch for systems with conductors, if is off, if you realize that the switch is off, open the engine protection switch .
	Invertor safe mode	Shut down the emergency stop button and check it by opening the emergency stop button again after 30 seconds. If failure cannot be fixed, determine the failure code from top of the invertor, and call the nearest service.
	Limit switch is stuck	See page 13 and 25 for relevant limit switch adjustment.
	Brake not opening	Brake coil might not get any energy or might get low voltage. Check the relay of nonoperating brake. There might be a failure on rectifier. Check them. Moving and fixed disc might be yielded, or facing might be stuck or burned because of high temperature.
	Control button not working	Check the button contacts and change damaged button contacts. Check the strength of remote control cable and connection of the cable. Check plug and socket connections.
Reductor leaks out oil	Problem in seals	Because of the corrision, reductor seals might leaks out oil. Change oil seals.
Hook is not rotating	Mechanical jam on hook	Hook might be stuck because of the dust and dirt between hook and trapez. Filing marked parts and cleaning bearings by removing hook might fix the failure.
Kinking of the wire rope	Hook block weight taken from wire ropes. Wire rope is loosen and stuck Guide and/or guide spring worn/broken	Check the wire rope, guide, and guide spring by removing guide and wire rope equipments and corrisions are determine. Damaged and worn parts must be changed.
Looping of the wire rope	Depends on remaining service life	Change wire rope with the new ones by reffering the informations. Change the wire rope by refering the instructions with appropriate ones (see p.28)
	Depends on an effect	Check all pulleys and change the low diameter pulley if any corrision seen. Remove all undesirable mechanical effects on wire rope.
Mechanical sound in hoist	Hook and guide failure	Clean wire rope and guide and oil them. Change the parts which corrision occured.
	Bearing failure	Check all bearing houses. If any corrision seen, change the bearings.
Hoist slides load	Corrision on facing of brake	Check the working gap by reffering the instructions on page 44. If the gap value is between tolerance values then make adjustments or change facing of brake.

G.2 PLC Fault codes

Failure	Reason	Troubleshooting
HIGH TEMPERATURE ON MOTOR	Exceeding the number of lifting per hour	Crane must be operated between the design boundaries. When motor is back on its optimal temperature, it will work again.
	Mechanical stuck	Find out which causes mechanical stuck and where is the mechanical stuck. If there is a break failure fix the break failure. Breakse might not get energy check the cables. If there is any failure except those, call the nearest service.
	Feeding voltage is low	If the feeding voltage is low motor gets more current. Low voltage must be fixed. Check the energy feedin cable section. Connect a cable with appropriate section.
	External fan failure	External fan failure must be fixed.
OVERLOAD	Overload	Remove overload. Move down overload slowly.
AS/FSR/KANCA SWITCH (*1)	If emergency stop button is off; If the energy feeding phase sequence is wrong or there is an instability between phases; When hook cuts off the down limit switch;	Open emergency stop again. Or, check the connections. Phase sequence connections must be adjusted. The movement must be done in the opposite direction of the direction which hook cuts off the limit switch. Or, check switch connections.
UP LIMIT SWITCH (*2)	Upward limit switch cuts off.	Movement must be done in downward direction. Check switch connections.
DOWN LIMIT SWITCH (*2)	Downward limit switch cuts off.	Movement must be done in upward direction. Check switch connections.
INVERTOR FAILURE (*2)	Instability between phases, Slackness between motor connections	Check the connections (motor, energy input , resistance)
	Inappropriate resistance or resistance is out of service	Choose appropriate resistance, and connect the appropriate resistance.

(*1) Lifting is done by double rotation contactor
(*2) Lifting is done by invertor

H Technical information

H.1 Terms of use

Protect from dust and damp
IP54

Permitted ambient temprature
-10°C ... +40°C (standard)

There are more options available for other ambient tempratures.

H.2 Supply cable sections

H.2.1 Bridge cable sections

Theoreticaly Estabblished Power (Hoist) (kW)	Cable Section (mm^2)	Acceptability Criteria			
		Bridge Length (S) (m)	System Voltage (VAC)	Cos (Q)	Voltage Drop (%e)
3	4 x 2,5	≤50	380 VAC	0,8	< %3
5,1	4 x 2,5				
11	4 x 4				
14	4 x 6				
18	4 x 6				
41	4 x 16				

H.2.2 Runway cable sections

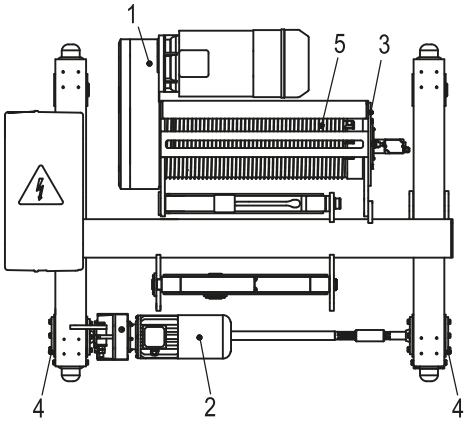
Total Establisged Power PT(kW)	Cable Section (mm^2)	Acceptability Criteria				
		Hall Length (L) (m)	System Voltage (VAC)	Cos (Q)	Voltage Drop (%e)	Lifting Length
$P_T \leq 7,5$	4 x 2,5	≤ 60	380	0,8	< %3	≤ 10
$7,5 < P_T \leq 7,5$	4 x 4					
$12 < P_T \leq 18$	4 x 6					
$18 < P_T \leq 30$	4 x 10					
$30 < P_T \leq 51$	4 x 16					

H.3 Lubrication

- The purpose of lubrication is to reduce friction forces between moving parts, prevent over warming, corrosion, keeping the parts clean and absorbing the instantaneous impacts.

Attention! Change the oil when reductors oil level is under half way.

Points to be lubricated for wire rope hoist machines



Lubrication Point	Hoist Type	Gearbox Type	Lubricant Type	ISO Viscosity Class	Lubricant Gauge (lt)	Lubricant Period
Hoist Gearbox (1)	GMD20	GH3200	Mineral Lubricant (CLP)	ISO VG 220	1,4	6 months 3000 hours
	GMD30	GH5000		ISO VG 220	4	
	GMD40	GH12500		ISO VG 220	5	3 years 6000 hours
	GMD50	GH20000		ISO VG 220	9	
	GMD60-65	GH25000	Synthetic Lubricant (PG, PAO)	ISO VG 680	13	5 years 10000 hours
	GMD70	GH40000	Synthetic Lubricant (PG, PAO)	ISO VG 680	19	
Trolley Gearbox (2)	GMD20-30	DR172	Mineral Lubricant (CLP)	ISO VG 220	1,4	2 years 10000 hours
		DR173			1,2	
		NR002			0,4	
		NR003			0,35	
	GMD40	DR272			1,4	
		DR273			1,2	
		NR102			0,65	
		NR103			0,6	
	GMD50	DR273			1,65	
		NR103			0,6	
		NR172			0,7	
	GMD60-65	DR272			1,75	
		DR273			1,65	
		DR283			1,85	
		DR373			2,9	
	GMD70	DR273			1,65	
		DR373			3,2	
		DR473			6,4	
		DR573			11,2	
Drum Bearing Slot(3)	All Hoists	All Hoists	Grease	High Viscosity	-	6 months 3000 hours
Trolley Heading Girder Bearing Slot (4)	All Hoists	All Hoists			-	
Rope(5)	All Hoists	All Hoists	Grease Liquid Grease	High Viscosity	-	
					-	

H.4 Sound level

- ***2006 / 42 / AT Machine Safety Regulations***

Basis of Health and Safety Regulations for Machines Safety Parts Design and Production
Basis of Health and Safety Rules
1.5 Protection to other dangers
1.5.8 Noise
Machines must be designed and produced to keep noise level minimum level to prevent any risks caused by airnborne sound emission.

1.7 Indicators
1.7.4 Operation instructions
Places use not harmonised methods sound level measured is the most convenient for the machines.
Manufacturer during the noise measurements specify machines' working conditions and methods.
In unspecified working areas, sound pressure level should be meausured 1m away from the machine and 1.60m above from the level. Specify the maximum sound pressure level and sound measurement points.

- ***2000/14/AT Regulation for noise emission by equipments used in open area***

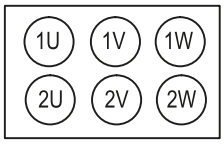
Equipment Type	Total Established Power (kW)	Permitted Level of Sound Db/1pW
Diggers, Freight Elevator, Construction Cranes, Motor Driven Hoe Machines	P ≤ 15	93
	P > 15	80 + 11 logP

Hoist Type	Established Power (kW)	db ±3 1m
GMD20	< 15	60 - 85
GMD30	< 15	60 - 85
GMD40	< 15	70 - 85
GMD50	> 15	75 - 85
GMD60	> 15	75 - 85
GMD65	> 15	75 - 85
GMD70	> 15	75 - 85

H.5 Electrical connections
H.5.1 Electrical motor connections
H.5.1.1 Hoist motor terminal box connections

Double speed hoist motor terminal box connections

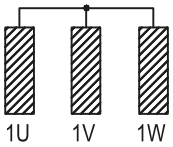
- Motor terminal box



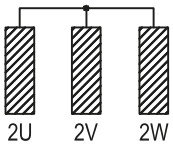
Low revolution motor terminator boxes

High revolution motor terminator boxes

- Motor spiral connections

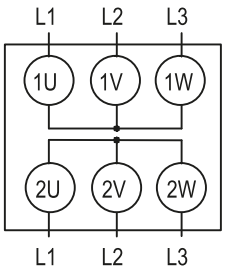


Low revolution windings



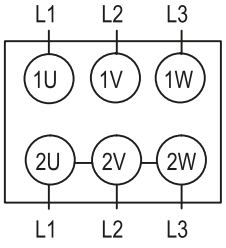
High revolution windings

- Low and high speed winding in the motor body connected correctly. For the terminal box, triangle or star connection is not applicable.
- For low speed winding (1U,1V,1W) and high speed winding (2U,2V,2W) can not give electricity at the same time.

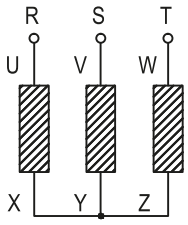


Single speed hoist motor terminal box connections

- Motor terminal box (for all machines) For the single motor speed use star connection.



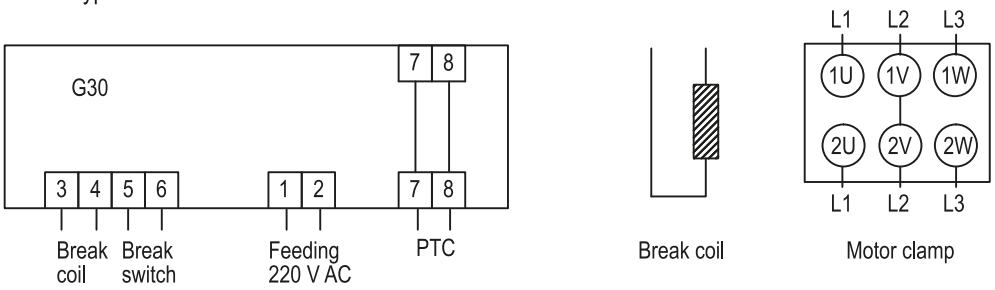
Star connection



Motor windings tips

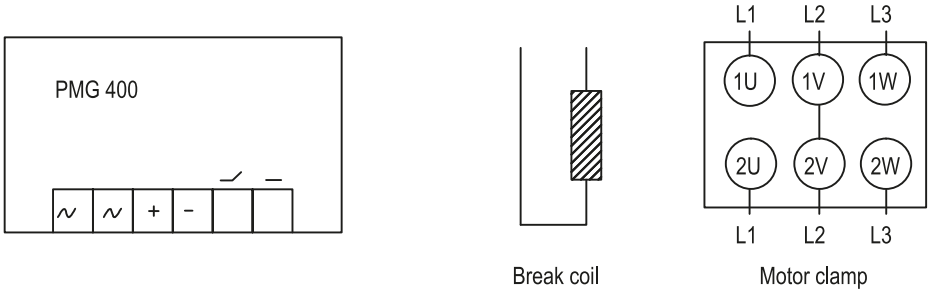
Motor, break and thermistor (GMD20 – GMD30)

• G30 Type rectifier



For G30 type rectifier;

- Use 220V AC feeding for 1 and 2 terminal box.(In double revolution engines, connections are made by manufacturer)
- For double speed motors, 220V AC feeding is made from star point L2 fuse.
- For single speed motors, 220V AC feeding is given by external sources.
- Break coils are connect to number 3 and number 4 termiall box by producer company.
- Break switch is connect to number 5 and number 6 terminal box.
- Thermistor PTC end is connect to number 7 and number 8 terminal box.
- Instead of G30, could be also used PMBA 400-S. Connection is the same of PMG 400.
- PMG400 motor, break and thermistor connections.(GMD40,GMD50,GMD60,GMD65,GMD70 series)



PMG400 type of rectifier's;

- Break coil is connect to (+) and (-) terminal box. (done by producer company)
- Break switch is connect to ⎍ ⎓ signed terminal box.
- 220V AC feeding is connect to ~ signed terminal box.(Connection is done by producer company for double speed motors.
- Instead of PMG400, could be used PMG500. Connections are the same.

Attention! Always check the electric projects before you do electrical connections.

H.5.1.2 Speed control terminal box connection

⏚	L1	L2	L3	PO	PA	PB	PC	U	V	W	⏚

Power circuit terminal box

LI1	LI2	LI3	LI4	+24		R2A	R2C

Control circuit terminal box

Power circuit terminal box

Terminal Boxes	Connection Ends
L1, L2, L3	If Speed control is 200V AC and mono phase, use L1 and L2 connectors. If speed control is three phase AC, use L1, L2, L3 connectors.
PA, PB	Resistance terminal boxes
U, V, W	Motor feeding terminal boxes

Control circuit terminal box

Terminal Boxes	Lifting direction	Terminal boxes
LI1	Upward direction	Right direction
LI2	Downward direction	Left direction
LI4	2nd speed	2nd speed
24	Remote control phase	Remote control phase
R2A, R2C	Break relay	Break relay

H.5.1.3 Contactor selection for wire rope machines

Engine Power (kW)	Engine Basic Information (Ampere)	Contactor Type			
		Emergency Stop (Ampere)	1st Speed (Ampere)	2nd Speed (Ampere)	Break (Ampere)
0,37 / 2,5	2,8 / 6	12	9	9	9
0,8 / 4,9	4,9 / 11,5	18	9	18	9
1,5 / 9,5	9 / 20	38	18	32	9
2 / 12,5	12 /27	50	18	40	9
2,6 / 16	16 / 33	50	25	50	9
38	20 / 40	80	32	80	9

H.5.1.4 Resistance selection according to hoist motor power

Motor Power (kW)	2,5	4	4,9 / 5,5	7,5	9,5 / 11	12,5 / 15	16 / 18,5	22	30	37 / 38
Resistance Values	36 Ω	29 Ω	19 Ω	53 Ω	20 Ω	19 Ω	14 Ω	14 Ω	14 Ω	8 Ω
	1500 W	2000 W	2300 W	3800 W	5500 W	7500 W	9300 W	11000 W	15000 W	19000 W

H.5.1.5 Resistance and Selection According to Trolley and Bridge Motor

Motor Power (kW)	0,18	0,25	0,37	0,55	0,75	1,1	1,5	2,2	3	2x2,2	2x3	4x1,1	4x1,5	4x2,2	4x3	4x4	4x5,5	4x7,5
Resistance Values	40 Ω 400 W													19 Ω 1500 W			14 Ω 9300 W	

GÜRALP VİNÇ ve MAKİNA KONSTRÜKSİYON SANAYİ VE TİCARET A.Ş.

COMMISIONING AND JOB FINISHING FORM

Document/Rev.No	: F.056 - 3
Page Number	: 1 / 1
First Publishing Date	: 07/06/2005
Rev. Date	: 23/12/2009
Ref. St. No	: 7.5.1/2 (TS EN ISO-9001:2008)

Customer Name : .....

Facility Address : .....

.....

Tel. / Fax : .....

Trademark : ..... Serial Number : .....

Type / Model : ..... Capacity : .....

Speed : Hook -> Single ☐ Double ☐ Troley -> Single ☐ Double ☐ Girder -> Single ☐ Double ☐

Report Number : Seri A No. 0001

Agreement Number : .....

Starting Date : ..... / ..... /201.....

Starting Hour : .....

Finishing Date : ..... / ..... /201.....

Finishing Hour : .....

Equipment	Adequate	Not	Equipment	Adequate	Not	Equipment	Adequate	Not
Hook Blog			Hook Deflaction			Girder Deflaction		
Rope and Equipment			Troley Engine Reducer			Girder Wheels		
Drum			Troley Brake Group			Remote Control Hoard		
Lifting Reducer			Troley Reducer			Remote Control Button		
Lifting Brake Group			Troley Wheels			Cables		
Aktarma Elemanları			Girder Engine			Power Line		
Lifting Engine			Girder Brake Group			Mechanic Connections		

№	Control Points	Unit	Reference	Measured	Result		Instructions
					Accept	Refuse	
1	***Girder Span (S)	mm					(For Agreement and TS ISO 8306)
2	Lifting Height (h)	mm					(For Agreement)
3	Rubway Lenght (L)	mm					(For Agreement)
4	Static Weight (Q x 1,25)	Kg					(For Fem 9.751, Health and safety conditions in use of work equipment regulations numbered 6331, TS 10116 April 1992)
5	Dynamic Weight (Q x 1,1)	Kg					
6	Girder Deflection (S / 800)	mm					(For DIN 18800)
7	Lifting Speed (V_h)	m/dk					(For Agreement)
8	Troley Speed (V_s)	m/dk					(For Agreement)
9	Girder Speed (V_L)	m/dk					(For Agreement)
10	Runway Beam Deflaction (L_1 / 800)	mm					(For DIN 18800)

***** If S ≤ 10 m than deviation must equal to ± 2 mm. If S ≥ 10 m than deviation must equal to ±[2+0, 10x(S-10)]. Max deviation will be 10 mm.**

SPECIAL DETAILS / INSTRUCTIONS:

(*1) If there is any different load whic is stated in specification;

Static weight (Qx.....)

Dynamic weight (Qx.....)

(Warranty №: .....)

Installation / start-up processes of the products detailed above are finalized. And delivered to the authorized person after testing. And also it's guaranty time started upwards finishing date.

The personel named below has been trained about using and renew the machines. This training will be done again by GURALP if customer wants again with any reasons (new personel hiring, etc.).

Informations of the Personel Joined to User Training:

Name-Surname	Signature	Name-Surname	Signature

If there is a fault or spare part changing fill the "Service Report (**F.063**)". Define the required informations below.

Service Report № : .....

Service Report Date : ..... / ..... / .....

Guralp Authorized Person
(Delivered Person Name / Surname)
Signature

Customer Authorized Person
(Received Person Name / Surname / Position / Date / Cache)
Signature

L Control and maintenance table

No	Controls	Control Periods				Maintenance Periods		
		Commisioning controls	Everday before operating controls	Every 3 months controls	Once a year controls	First year after commisioning maintenance	Once a year maintenance	After 10 years from commisioning maintenance and general revisions
1	Break functions	•	•	•	•			
2	Synchronization of control buttons and cranes' movement	•	•	•	•			
3	Emergency Stop Button	•	•	•	•			
4	Crane upward-downward limit switch	•	•	•	•			
5	Trolley left-right limit switch	•	•	•	•			
6	Wire rope safety latches	•	•	•	•			
7	Hook work		•	•	•			
8	Wire rope wear and fractures		•	•	•			
9	Overload limit switch	•		•	•	•	•	
10	Break running clearence value			•	•			
11	Hook beak size and recording			•	•			
12	Cracks, wear, cold deformation at hook ,			•	•			•
13	Machine connection components (bolt, welding, gudgeon etc.)	•		•	•	•	•	•
14	All locking functions control (wire rope lugs, segment, spindle lock, wire rope wedge etc.)	•		•	•	•	•	
15	General rope control, wear and fractures			•	•			
16	Fixing wire rope	•		•	•			
17	Drum wear			•	•			•
18	Wire rope shoes			•	•			
19	Rope pulley wear			•	•			
20	Lubrication of reductor			•	•			
21	Mechanical sounds and jams in gears and moving parts			•	•			•
22	Wheels and rails			•	•			•
23	Mechanic stopper and buffer	•		•	•			
24	All electrical wiring, fittings, connections and grounding	•		•	•			
25	All machines ID label informations	•		•	•			
26	Control buttons, wire connections, steel wire tension	•		•	•			
27	General cleaning	•		•	•			
28	Crane load test	•		•	•			
29	Check break running clearence value , if it is necessary change break disc					•	•	
30	Lubricate wire rope and wire rope guide with a brush					•	•	
31	Check electrical wiring and fittings and tightened them	•				•	•	
32	Wheels, pulleys, drum grooves,guiderouting elements (1) wear control					•	•	
33	Lubrication of bearings					•	•	
34	Determination of safety working period					•	•	
35	Hoist					•	•	•

GÜRALP VİNÇ ve MAKİNA
KONSTRÜKSİYON SANAYİ VE TİCARET A.Ş.

PERIODICAL MAINTENANCE CHART

Document/Rev.No : F.171 - 0
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First Publishing Date : 12/05/2014
Rev. Date : - / -
Ref. Stand No : 7.4 (TS EN ISO-9001:2008)

Maintenance Date	Change / Repair	Maintenance Result	Maintainer's Name / Signature

GÜRALP VİNÇ ve MAKİNA
KONSTRÜKSİYON SANAYİ VE TİCARET A.Ş.

COMMISSIONING, PERIODIC CONTROL CHART

Document/Rev.No : F.172 - 0
Page Number : 1 / 1
First Publishing Date : 12/05/2014
Rev. Date : - / -
Ref. Stand No : 7.4 (TS EN ISO-9001:2008)

COMMISSIONING

Date	Result	Name / Signature of the Personel Commissioned the Equipment

PERIODIC CONTROL CHART			
Control Date	Failures	Control Result	Name / Signature of the Personel Commissioned the Equipment

GÜRALP VİNÇ ve MAKİNA
KONSTRÜKSİYON SANAYİ VE TİCARET A.Ş.

CE

EC DECLARATION OF CONFORMITY

Certificate No. :
Manufacturer : GÜRALP VİNÇ ve MAKİNA KONSTRÜKSİYON SAN. VE TİC. A.Ş.
Address : Yedi Eylül Mahallesi Ümit Tunçağ Caddesi No: 4 Torbalı / İzmir TÜRKİYE
Trademark : GÜRALP VİNÇ ve MAKİNA

Declares that ;
Model/type : "GH type 03,05,12,20,25,40,52" and "GMD type 20,21,30,31,40,41,50,51,60,61,70,71,81"
Serial No :
Referans No :
Description of machinery : Hoisting Machine GH and GMD type (With or without trolley)

Appropriate to the European Harmonized standards and other related technical specifications as follows;

RELATED STANDARTS:

- FEM 1.001
- FEM 9.341
- FEM 9.511
- FEM 9.661
- FEM 9.683
- FEM 9.941
- DIN 15401
- DIN 15402
- BS EN ISO 15614-1
- BS EN ISO 15609-1
- TS 10116
- TS 10316
- TS EN 1418
- TS EN 5817
- TS EN 287 +A2
- TS EN ISO 12100 :2010
- TS ISO 8306
- TS CEN ISO/TS 15608
- EN 55011
- EN 60034-5
- EN 60034-1
- EN 61000-3-2
- EN 61000-3-3
- EN 61000-4-2
- EN 61000-4-4
- EN 61000-4-5
- EN 61000-4-6
- EN 61000-4-11
- EN 12077-2_2002
- EN 60204-1/19-2/19-4/19-5_2005

RELATED DIRECTIVES:

- 2006/42/EC MACHINERY DIRECTIVE
- 2006/95/EC LOW VOLTAGE DİRECTIVE
- 2004/108/EC EEC ELECTROMAGNETIC COMPATIBILITY DIRECTIVE
- 2000/14/AT NOISE EMMISION IN THE ENVIRONMENT BY EQUIPMENT USE FOR OUTDOORS DIRECTIVE

The Undersigned Company certifies under its sole responsibility that the item of equipment specified above satisfies the requirements of the related directives above which has applied to it.

SIGNED ON BEHALF OF THE MANUFACTURER

PLACE/ DATE: 13.05.2014
Alparslan KURTMEN
GENERAL MANAGER

ISO 3834-2 EN 1090-1 ISO 9001

GÜRALP®
VİNÇ ve MAKİNA
www.guralpvinc.com.tr

Güralp Vinç ve Makina Konstrüksiyon Sanayi ve Ticaret A.Ş.

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