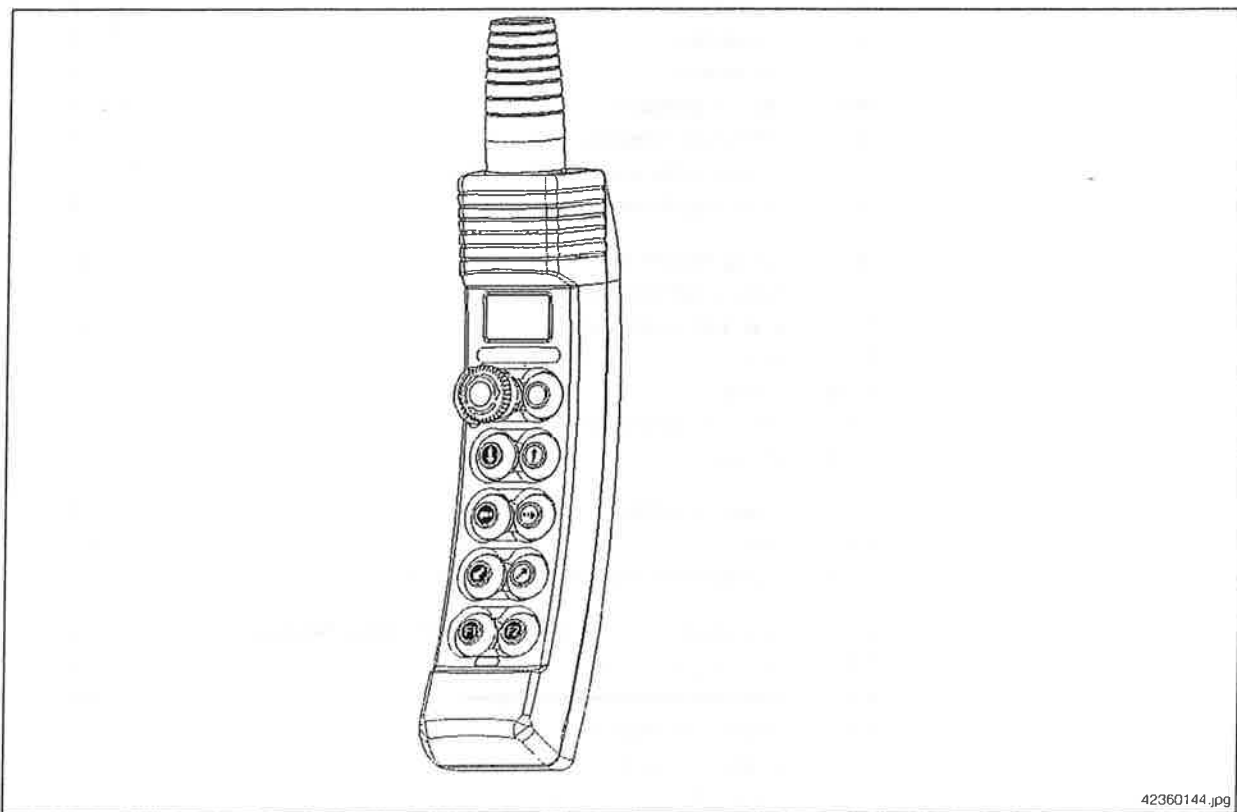


DSE-10R control pendant

Operating instructions and technical data



Manufacturer

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1 Use

Control pendants of the DSE-10R series are exclusively intended for use with rope hoists of the DR series with CAN bus technology.

DSE-10R control pendants are supplied with 10 openings in double-row arrangement as standard.

2 Safety instructions

2.1 Symbol description

The following symbols and recommendations indicate potential safety hazards or causes of damage or provide useful information.



Hazard warning

This symbol appears in the operating instructions next to all instructions relating to safety at work wherever a potential hazard to life and limb exists if the instructions are not complied with.

Follow these instructions at all times and be particularly vigilant and cautious.

Pass on safety instructions to all persons entrusted with working on the product including the power supply.

In addition, observe all general safety regulations at all times.



Warning against dangerous electrical voltage

Contact with live parts can result in immediate death. Protective covers (e.g. covers and enclosures) marked with this sign may only be opened by qualified electricians. Before opening, all relevant operating, control, feed or other voltages must be disconnected.



Operating hazard for the installation

This symbol in the operating instructions indicates all warnings which, if not complied with, may result in damage to the product.

2.2 Intended use

The product may only be operated when in perfect working order by trained personnel in accordance with the relevant safety and accident prevention regulations. This also includes compliance with operating and maintenance conditions specified in the operating instructions.

This product is industrial equipment to be used with the rated voltage specified on the type plate.

During maintenance work the appropriate main switches must be switched off.

During operation or when the main switch is not switched off, electrical components inside enclosures, motors, switchgear cabinets, terminal boxes, etc., carry dangerous voltages. This voltage may cause fatal injuries.

Serious personal injury or damage to property may occur in the event of:

- unauthorized removal of covers,
- inappropriate use of the product,
- incorrect operation,
- insufficient maintenance,
- working on live parts.

2.3 Inappropriate use

Certain work and practices are prohibited when using the product as they may involve danger to life and limb and result in lasting damage to the product, e.g.:

- Tampering with or manipulating electrical equipment.
- Connecting the unit to power supply with voltage or frequency other than those specified on the type plate.
- Non-compliance with specified mounting positions.
- Non-compliance with the max. permissible operating temperature.

2.4 Basic information on safety

Persons under the influence of drugs, alcohol or medicines which affect reactions must not install, operate, put into service, maintain, repair or disassemble the product. Any conversions and modifications to the installation must comply with the technical safety requirements. Work on electrical equipment may only be carried out by specialists in accordance with electrical regulations. In the event of malfunctions, the product must be stopped, switched off and the relevant main switches locked immediately.

Malfunctions must be eliminated immediately.

National accident prevention regulations and codes of practice and general safety regulations must be observed when operating our products. Important information and instructions are marked by corresponding symbols. Follow these operating and safety instructions to avoid personal injury and damage to machinery.

The operating instructions must be kept available at the place where the product is in use at all times.

They include significant aspects and appropriate excerpts from the relevant guidelines, standards and regulations. The owner must instruct his personnel appropriately. If the safety instructions given are not observed in any way, personal injury or even death can result.

Observe general statutory and other obligatory regulations relating to accident prevention and environmental protection and basic health and safety requirements in addition to those included in these operating instructions.

Such requirements may relate, for example, to the handling of hazardous materials or the provision/wearing of personal protection equipment.

Comply with these regulations and general accident regulations relevant for the place at which the product is used and follow the instructions therein when working with the product.

The product may still constitute a danger to life and limb if it is installed, operated, maintained or used inappropriately by personnel who have not been trained or specially instructed.

The safety instructions must, if required, be supplemented by the owner with instructions and information (e.g. factory regulations) relating to organization of work, working procedures, operating personnel, etc. Supervising and reporting obligations as well as special operating conditions must also be taken into consideration.

Personnel assigned to working with the product must have read the operating instructions and the safety instructions.

All activities relating to the product which are not described in the operating instructions may only be carried out by specifically trained specialist personnel.

The owner must ensure that personnel work in a safety and hazard-conscious manner in compliance with the operating instructions.

The owner must ensure that product is only operated when in proper working order and that all relevant safety requirements and regulations are complied with.

The product must be taken out of service immediately if functional defects or irregularities are detected.

In the event of a stoppage (e.g. if defects regarding safe and reliable operation are detected, in emergency situations, in the event of operating malfunctions, for maintenance purposes, if damage is detected or after finishing work), the operator/experienced technician must carry out all prescribed safety measures or observe that they are automatically carried out.

Personal protective clothing must be worn as necessary or as required by regulations. Personnel must not wear loose clothing, jewellery including rings or long hair loose. Injury may occur, for example, by being caught or drawn into the mechanism.

All safety and hazard warnings on the product, its access routes and mains connection switches must be preserved completely and in legible condition.

Modifications, additions to and conversions of the product which might impair safety in any way must not be carried out without the approval of Demag.

Safety devices must not be rendered inoperative.

Only genuine Demag spare parts may be used. Observe prescribed deadlines or those specified in the operating instructions for routine checks/inspections.

2.5 Safety instructions for installation and disassembly

- Installation and disassembly work may only be performed by experienced technicians.
- Installation and disassembly work must be co-ordinated by the person carrying out the work and the owner within the scope of their responsibility.
- The assembly zone must be made safe.
- The installation must be isolated in accordance with the relevant electrical regulations.
- Customer-specific regulations must be observed.
- Only appropriate, tested and calibrated tools may be used.

2.6 Safety instructions when first putting the unit into service after completing installation

- The working area must be made safe.
- First check that the voltage and frequency specified on the type plates match the owner's mains power supply.
- In the course of putting the product into service, it may be necessary to render safety devices or features inoperative when carrying out adjustments or function checks.
- When putting the unit into service, it may be necessary to perform work in the danger zone, therefore, it must be ensured that only appropriately trained personnel are employed for this work.

2.7 Safety instructions for operation

All instructions and measures described in the operating instructions with regard to safe operation and items concerning general safety and accident prevention which have to be observed before, during and after putting into service must be strictly complied with. Any failure to comply can lead to accidents resulting in fatalities.

The product must be taken out of service immediately or not put into operation if any defects relating to operating safety and reliability are detected.

Safety devices must not be rendered inoperative or modified in contradiction to their intended use.

Only operate the product when all protective devices and safety-relevant equipment, e.g. movable protective devices and emergency-stop devices, are fitted and fully functioning.

In the event of damage to electrical devices and cables as well as parts of the insulation, immediately switch off the product.

Before switching on/putting into operation of the product, it must be ensured that nobody is endangered by operation of the product.

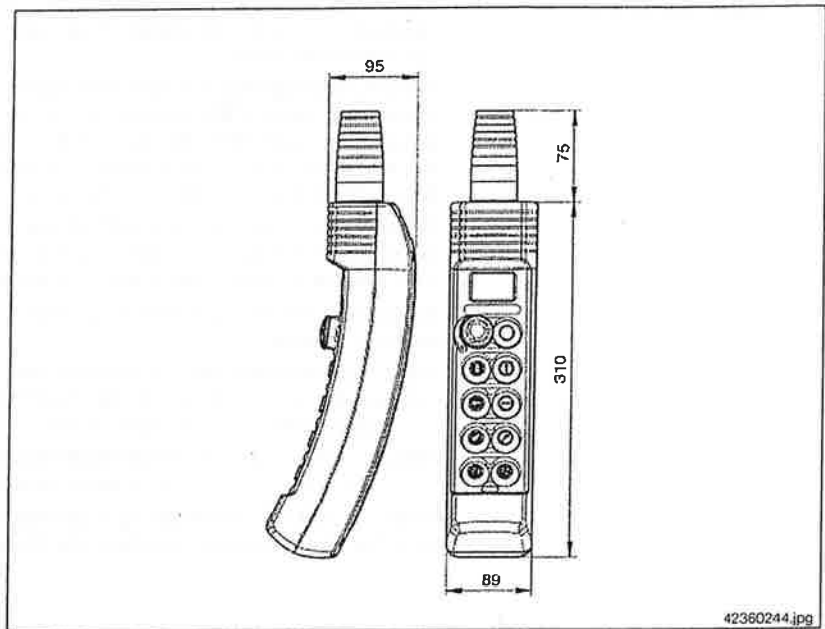
If the operator notices persons who may be exposed to a risk to health or personal safety by operation of the equipment, he must suspend operation immediately and may not resume operation again until the persons are outside the danger zone.

Before putting the product into operation, the operator must be satisfied that the product is in safe and correct operating condition.

Work on the product may only be carried out when instructions to this effect have been issued, when operation and function of the equipment have been explained and when the working and danger zone has been made safe.

Cooling devices, such as ventilation openings, may not be rendered permanently inoperative (e.g. covered or closed). Special local conditions or special applications can lead to situations which were not known when this chapter was written. In such cases, special safety measures must be implemented by the owner.

3 Technical data



3.1 Design features

- The ergonomic curved housing design of the control pendant permits operators to work in a natural position, reducing fatigue.
- No internal wiring is required in the pendant housing thanks to the PCB with central connection feature.
- An LCD display is integrated to display the load and service data.
- The housing is made of high-quality thermoplastic which is highly resistant to impacts.
- Protective insulation to VDE 0100 part 410, section 6.2.
- Switching distances and forces to DIN 33 401, holding force < 8 N.
- IP 65 enclosure to DIN VDE 0470 T.1 and EN 60 529 as standard.
- The housing is non-flammable, climate and corrosion-proof.
- Mostly resistant to fuels, salt water, grease, oils and lyes.
- Strain relief by means of control cable as standard.
- Standard impact protection against arduous ambient conditions.

4 Design and installation instructions

4.1 Components

The control pendant housings are made of high-quality thermoplastic which is highly resistant to impacts. The housing upper part is yellow RAL 1007, the housing lower part black RAL 9005.

The control pendants have been designed in accordance with ergonomic requirements. The shape of the housing permits low-fatigue work, also when wearing gloves. The pushbuttons feature a large contact surface and require only low actuating and holding forces. The relevant manual holding force for switching is less than 8 N and therefore complies with DIN 33 401.

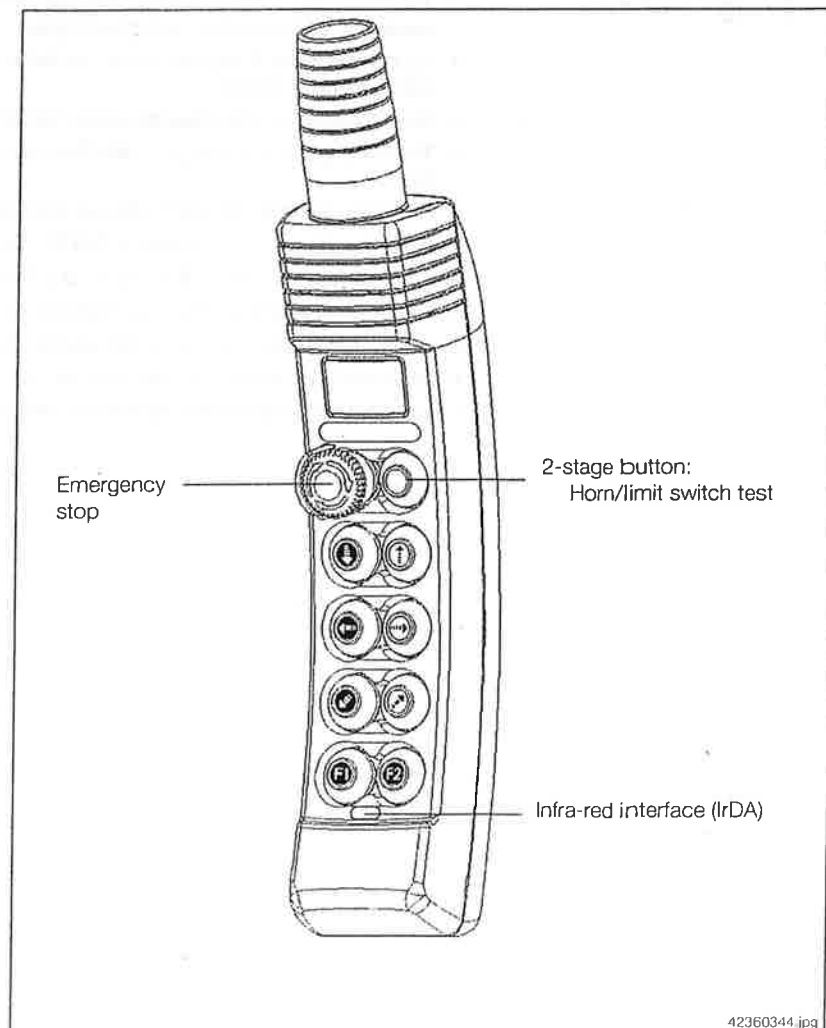
The elliptical shape of the DSE-10R control pendant housings is a special feature. It permits operators to work in a natural, comfortable position, reducing fatigue. The ribbed rear side of the pendant prevents the operator's hand from slipping.

As standard, the control pendant is provided with an infra-red interface (IrDA) for service purposes.

The designation labels are self-adhesive and resistant to abrasion. The arrow symbols comply with the symbols defined by the FEM (Fédération Européenne de la Maintenance) section 9.941 and DIN 15012 (draft).

Colours: – Yellow symbol against black background
– Black symbol against yellow background

If the DSE-10R control pendant is used under particularly arduous ambient conditions, the control pendant housing is additionally protected by means of a bumper.



4.2 Regulations

The control pendants comply with the regulations for Low voltage switchgear DIN VDE 0660 and EN 60947, IEC publications 337-1 and 158-1 as well as the rules to CSA (Canada and USA).

4.3 Resistance

The material of the control pendant housing is impact-resistant, non-flammable, climate and corrosion-proof. It is mostly resistant to fuels, greases, oils, salt water and lyes. The materials used are suitable for the high electrical and mechanical requirements.

The max. permissible operating temperatures for rubber and thermoplastic parts are - 25 °C to + 70 °C.

4.4 Type of enclosure

In suspended operating position, the ready-for-operation control pendants fulfil type of enclosure IP 65 to DIN VDE 0470 T. 1 and EN 60529, i.e. they are dust-proof and protected against hose-water from all directions.

4.5 Protective measures

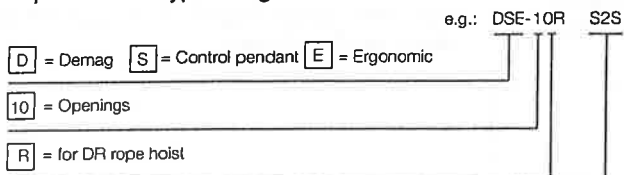
High electrical safety owing to protective insulation to DIN VDE 0100 part 410, section 6.2.

4.6 Control cable union and strain relief

For all types, strain relief is implemented via two vulcanised steel wire cords on the control cable.

4.7 Switching elements

Explanation of type designation

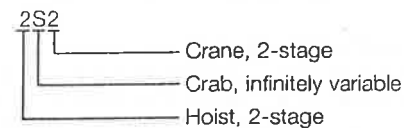


Switching functions

S = infinitely variable

2 = 2-stage

Example for switching functions on the DSE-10R:



Possible variants: 2S2, 2SS, SSS

5 Using the unit for the first time

Note:

For application of the DSE-10R control pendant in crane installations, the owner must observe the regulations and instructions of the BGV D6.

All components are designed for operation in industrial environments.

The DSE-10R control pendant has been built in compliance with the regulations and rules of the BGV D 6 for cranes, the EN 60204-32 and EN 954-1.

All units have been tested in accordance with the EMC directives and comply with the relevant standards regarding interference emission and resistance to interference for application in industrial environments.

5.1 Casing seal/seal breakage

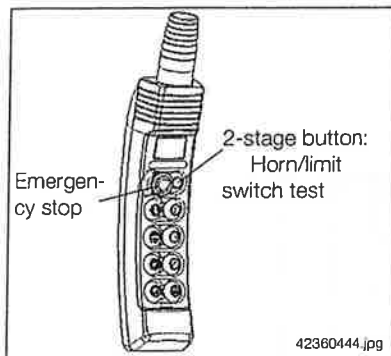


The DSE-10R control pendant is sealed in the factory.

The equipment may only be opened for repair purposes by authorised parties.

Breaking of a casing seal such as this will result in loss of all warranty rights!

5.2 DSE-10R control pendant



Demag DSE-10R multi-button pendant control switches are used to control the rope hoist.

Demag rope hoists are generally fitted with an emergency limit switch and a test button (2-stage) in the DSE-10R control pendant. The test button makes it possible to by-pass the "Lifting" operating limit switch for checking the emergency limit switch. The control pendant is fitted in accordance with sections 6.1.3 and 6.1.4.

The control pendant should be suspended so that the bottom edge is approx. 1 m above floor level.

The arrow symbols on the buttons must indicate the correct direction of the respective movement.

The control pendant is generally of plug-in design, this ensures service and maintenance-friendly installation.

5.2.1 Principle

The DSE-10R consists of an integrated mechatronics solution, i.e. the actuating mechanical system acts on a magnet sensor system that evaluates the control commands via an electronic system.

This makes stepless actuation of all three motion axes possible. Owing to the optionally selected drives, the integrated DR control system generates connection either in stages or infinitely variable.

5.2.2 Wiring

The integrated DR control system for the first time features transmission of control signals from the DSE-10R control pendant to the DR control system or to the crane control system via a CAN bus. This makes it possible to reduce wiring requirements to a minimum. The number of connection diagrams is reduced to a single diagram.

5.2.3 Infra-red interface (IrDA)

All DSE-10R control pendants are provided with an integrated infra-red interface (IrDA) for reading and transmitting the service data of the DR rope hoist.

5.2.4 Display

In addition, information on the load value and the service data is available via the standard display.

When the standard SGS load detector is used and the load is detected by means of slip calculation, the load value trend is displayed.

When the strain gauge carrier link available as an option is used as load detector, the load is precisely displayed.

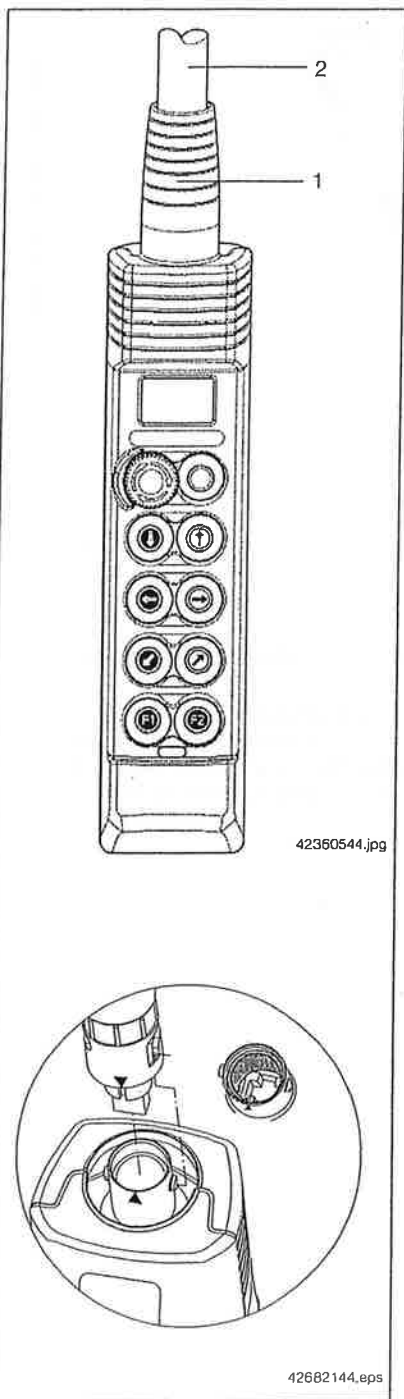
6 Connecting the control cable

6.1 Fitting



Electrical installation work must only be carried out by a qualified electrician, see also section 1 "Safety instructions".

Control pendant suspension height approx. 1000 mm above floor level.



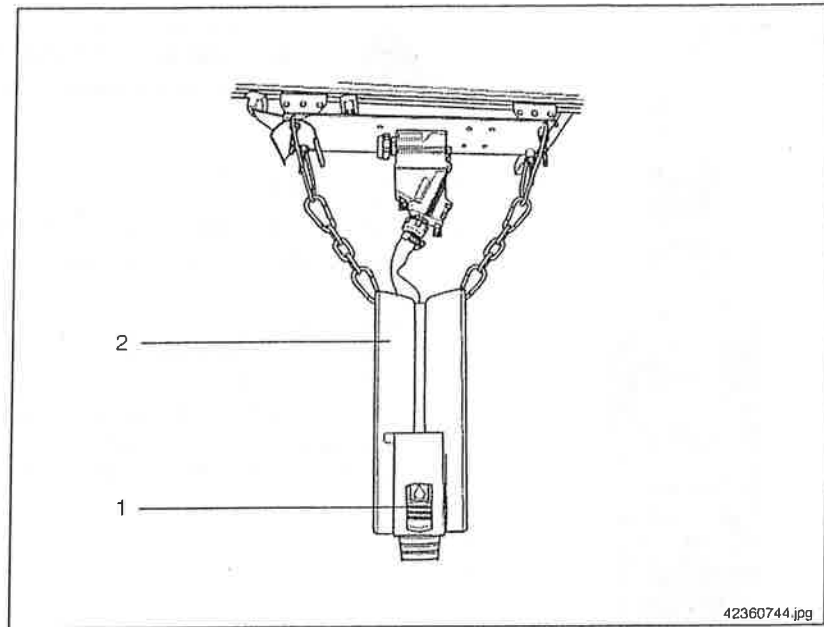
Proceed as follows:

1. Slide kinking protection sleeve (1) onto control cable (2).
2. Plug the control cable into the control pendant and turn the bayonet lock until it is locked.

Ensure that

- the groove of the connector holder matches the swivel lock in the control pendant housing and
 - that the two pins on the control pendant housing match the bayonet lock.
3. Slide the kinking protection sleeve over the control cable until the kinking protection sleeve latches with the housing lower part and the housing cap.

6.1.1 Connection to the KBK trailing cable trolley



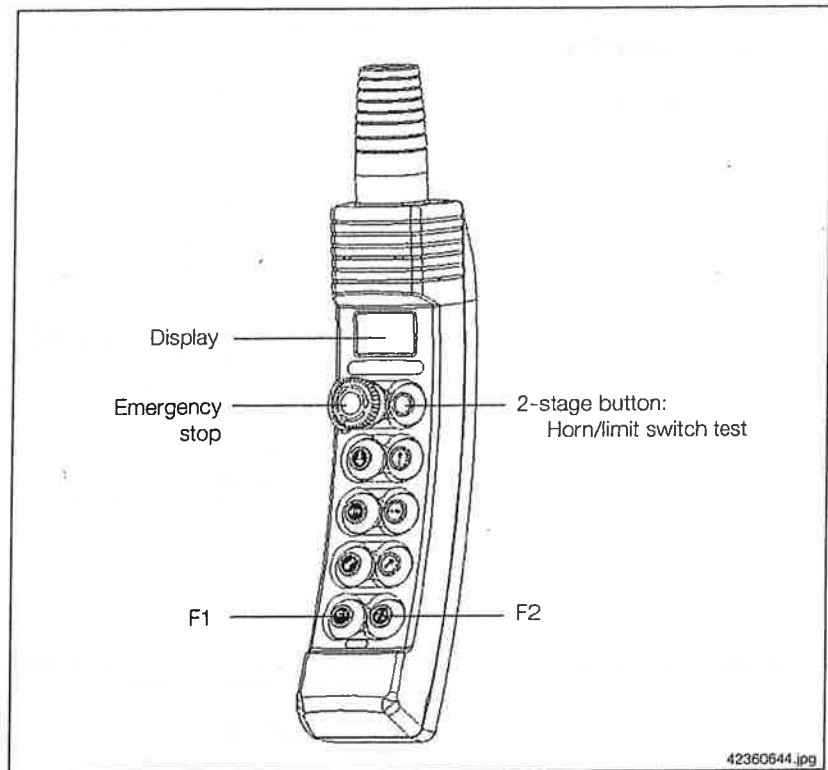
Control pendant height adjustment:

DSE-10R control pendants are supplied with cable lengths of 6 m or 10 m as standard. The height variation is approx. 4 m.

The suspension height can be adjusted by means of a self-locking clamping mechanism at any time to suit individual requirements. The control pendant can be adjusted to a different suspension height by unlocking the clamping mechanism (1). The control cable that is not needed is bundled and accommodated in the cable collector (2).

7 Operating elements of the DSE-10R control pendant

7.1 Operating functions



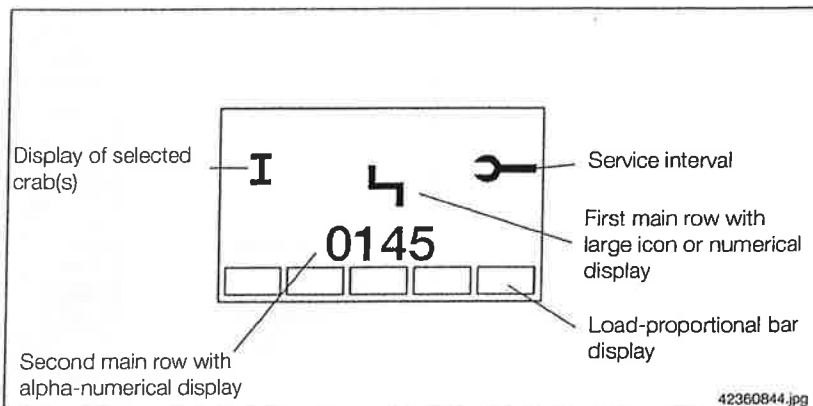
Introduction

In the following, the LCD display and its display functions are described. In addition, the various operating modes are also explained.

7.2 DSE-10R control pendant display

The DSE-10R is provided with a display. In the display, all data important for operation of the crane to be operated are shown.

7.2.1 Scope of the display



7.2.2 Display of selected crab(s)

The display of the selected crabs is only active, if there are two crabs and both can be operated with one DSE-10R unit.

Symbol	Meaning
I	Crab 1 is selected
II	Crab 2 is selected
I+II	Crabs 1 and 2 are selected

7.2.3 Display of service interval



This icon indicates that the Demag Service or a service company authorized by Demag must be called in for service work.

7.2.4 Icons in the first main row

In the first main row, all icons important for operation are shown.

7.2.4.1 Fault icon



The fault icon is displayed in the event of a fault. The code of the fault is displayed in the row below. If there are several faults at the same time, the code displayed changes in cycles.

7.2.4.2 Warning icon



The warning icon is displayed in the event of a warning. The code of the warning is displayed in the row below.

7.2.4.3 Overload icon



The overload icon is displayed in the event of an overload. The load of the selected crab(s) is also displayed in the row below if the hoist is fitted with ZMS.

7.2.4.4 Brake icon



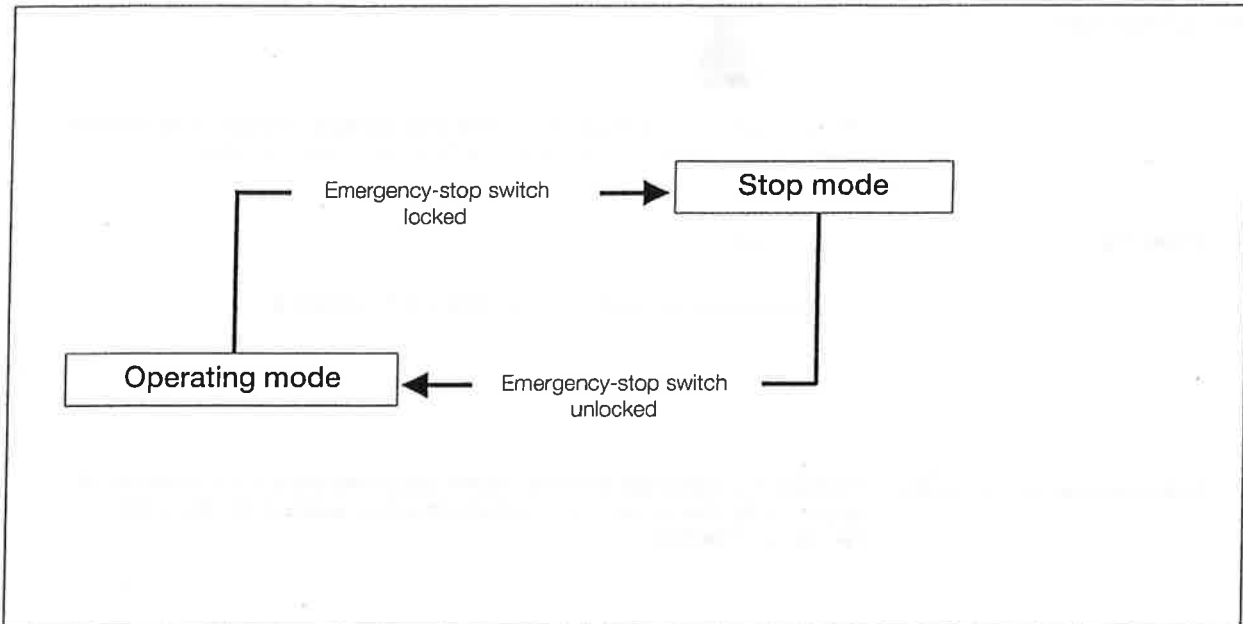
The brake icon is displayed, if the additional brake has been applied.

7.2.5 Load-proportional bar display

The load-proportional bar display shows the load on the crane in five increments of approx. 20 %. This display is independent of the crab selection and always refers to the max. possible load.

7.3 Operating statuses of the DSE-10R control pendant

The function and display of the DSE-10R control pendant are determined by the operating status of the control pendant. The operating status of the control pendant is transmitted to the crane control system. In addition to Stop mode, operating mode is also possible:



7.3.1 Stop mode

Stop mode is the basis for all operating statuses and menus. Travel motions are not possible in Stop mode. To change to other operating statuses or into other menus, key sequences are used:

7.3.2 Changing to operating mode

- Unlock emergency stop switch

7.3.3 Changing to the System data menu

- Lock emergency-stop switch
- Actuate the Horn key twice
- Actuate the horn key again and hold it down for 5 seconds
- Release the Horn key

Attention:

The Horn key must not be pressed down completely but only to the first stage.

7.4 Operating mode/ operating functions

In operating mode, the DSE-10R is fully functional and continuously exchanges data with the DR rope hoist. Operating and travelling the crane is only possible in operating mode. The Lift, Lower, Left, Right, Forward and Reverse keys are used to control the travel motions. All the other keys are functional, too:

7.4.1 F1 key

Actuate the F1 key to change the crab selection, if there are several crabs. Every time the key is actuated, the selection is switched one step further:

I -> II -> I+II -> I

The changed crab selection is shown in the display of the control pendant. If there is only one crab, the F1 key has no function.

7.4.2 F2 key

When the F2 key is actuated for 5 seconds, the current load value of the selected crab(s) is saved as a tare value.

7.4.3 F1/F2 keys, additional functions

The F1 and F2 keys can also be assigned optional additional functions (e.g. grab, magnets, etc.).

7.4.4 Horn key, first stage

When the first stage of the Horn key is actuated, the horn in the crab control system is activated.

7.4.5 Horn key, second stage

When the second stage of the Horn key is actuated and held down for more than 5 seconds, the limit switch test for hoist units with operating limit switch is activated.

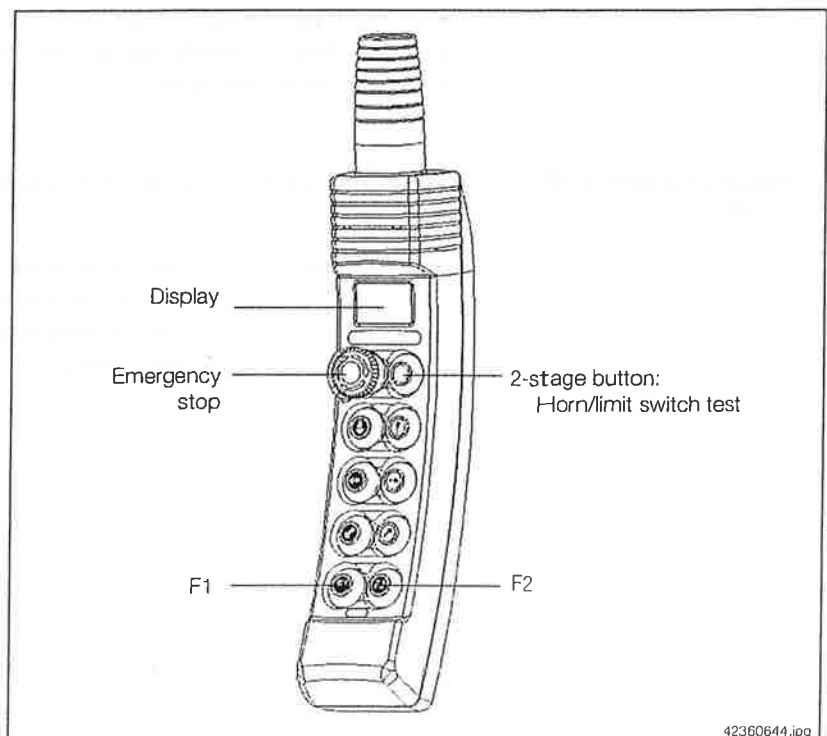
7.4.6 Emergency stop switch

If the emergency-stop key is actuated in operating mode, this triggers several reactions:

- The emergency-stop switch stops all travel motions as rapidly as possible (Emergency stop), activates all brakes and switches off the crane contactor.

Since this may result in load sway, the emergency-stop switch must only be actuated in dangerous situations or at standstill.

- The control pendant changes from operating mode to STOP mode.
- In the display of the control pendant the "STOP" icon appears.



7.5 Menus in stop mode

When the DSE-10R control pendant is in Stop mode, display and modification menus can be activated via the display and the keys of the pendant. These menus make it possible to call information about the crane and/or the crab(s). These menus can only be accessed via complex key sequences:

Activating the Information menu

- Actuate emergency stop switch
- Actuate stage 1 of the Horn key twice
- Actuate stage 1 of the Horn key again and hold it down for approx. 5 seconds
- Release the Horn key again

7.6 Information menu

The Information menu makes the display of information on the crane or the crab(s) possible. This information is stored in the form of a list by each DR control system. One element of this list is requested by the DSE-10R control pendant and made available by the selected control system via the CAN bus.

Note:

Access to information on the crane and the crab(s) is only possible for cranes with CAN bus technology.

7.6.1 Activating the menu

- Actuate emergency stop switch
- Actuate stage 1 of the Horn key twice
- Actuate stage 1 of the Horn key again and hold it down for approx. 5 seconds
- Release the Horn key again

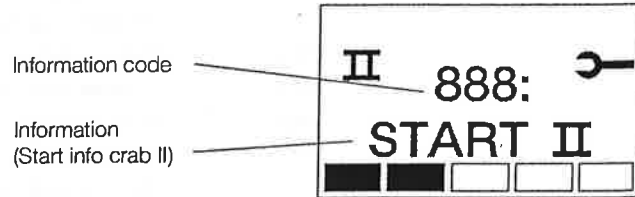
7.6.2 Selecting the information source

Selection of the polled control system is analogue to crab selection. Since the F1 key has no function in the information menu, the information source must be selected in operating mode:

Crab selection	Information from
I	Crab 1 control system
II	Crab 2 control system
I+II	Crane control

7.6.3 Starting screen

After changing to the Information menu, the starting screen of the Information menu is shown in the display of the DSE-10R control pendant. This starting screen shows information START II (since crab 2 has been selected) and code 888:



42360944.jpg

7.6.4 Navigating in the Information menu

To navigate in the information list, use the following keys:

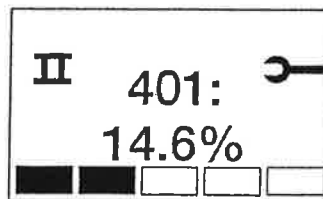
Key	Function
Right	to the next value in the list
Left	back to the previous value in the list
Lifting	exit the Information menu

7.6.5 Data of the Information menu The following data can be displayed via the Information menu:

Code	Information
401	Remaining duration of service in % (determined from load spectrum)
400	Operating hours
000	Permissible full load hours acc. to FEM classification
001	Gearbox transmission ratio
002	Drum diameter
003	Reeving factor
004	Control type (crab or crane)
005	Solo crab (with/without crane control)
146	Customer number
147	Order number
148	Serial number
149	Year of manufacture
150	Hoist speed V1
151	Hoist speed V2
152	Lifting height
155	Rope diameter
216	Serial number of control system
217	Hardware version
520	Software version of main controller
529	Software version of monitoring controller

Sequence and quantity of information depend on the software and may be changed.

The following example shows the remaining duration of service:



42361044.jpg

8 Designations / symbols on the control pendant

As standard, all keys on the control pendant are designated in the factory with the relevant foil symbols.

If requested by the owner, it is also possible to apply other, for example, country-specific symbols for the direction keys on the control pendant. The owner then has to apply the symbols required by him over the existing symbols. Note that when the control pendant is used in connection with a DR rope hoist, the functions of the individual keys are pre-defined.

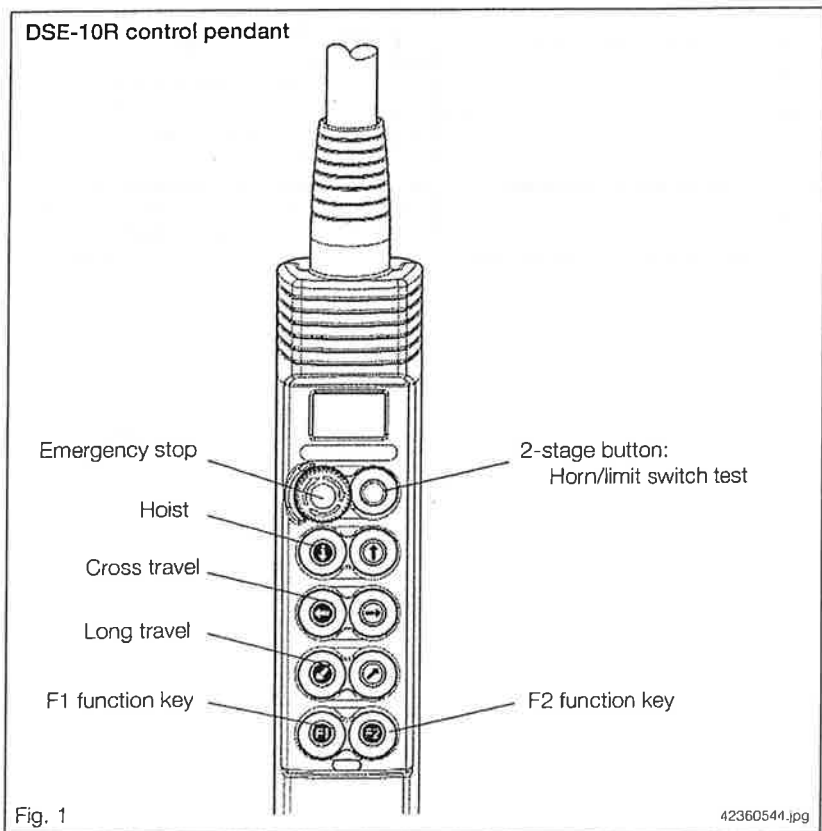
To replace the symbols, proceed as follows.

- The symbol field must be free from adhesive, dust and grease. Clean, as required, with spirit or alcohol.




Solvents, benzene, cold sprays, etc. could damage the housing material. (see fig. 1 for hoist unit functions)

- Apply the symbol required for the assigned function in the symbol field.



9 Instructions for finding faults

No.	Problem		Possible causes	Elimination
Putting into operation				
1	No display	a	No voltage supply on control pendant	Check voltage supply 48 V AC
		b	Overvoltage on control pendant	Unit defective -> replace control pendant
		c	Undervoltage on control pendant	Apply voltage supply 48 V AC
		d	Display defective	Replace control pendant
2	Approx. 3 sec. after switching on, the DEMAG display does not go out	a	Cable connection to rope hoist interrupted	Check cable connection
		b	Error in electrical equipment of rope hoist	Check electrical equipment of rope hoist, see rope hoist operating instructions
		c	Control pendant defective	Replace control pendant
Normal operation				
3	"No response to Horn key"	a	STOP activated	Unlock STOP
		b	Signal encoder in hoist unit electrics is not connected	Plug connector onto signal encoder
		c	Hoist unit electrics defective	Replace hoist unit electrics
4	"No response to crab selection"	a	STOP activated	Unlock STOP
		b	Incorrect parameter of crab(s)	Change parameters setting
		c	Error in hoist unit electrics	Replace hoist unit electrics

	EC conformity declaration		1 page(s) Page 1
	Demag control pendants DST, DSK, DSE, DSM5, DSC, DSM-C		Ident no. 205 391 44 #
	in accordance with EC directive 73/23/EEC, Annex III		Issue 0404 EN

Hereby we,

Demag Cranes & Components GmbH



declare that the product

Demag control pendants #
DST, DSK, DSE, DSM5, DSC, DSM-C 1)

of serial design is in conformity with the provisions of following relevant regulations:

EC Low voltage Directive 73/23/EEC
amended by 93/68/EEC

Applied harmonised standards:

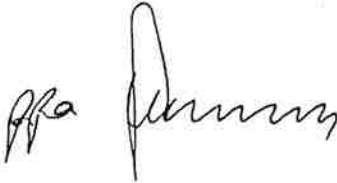
EN 60529 Types of enclosure (IP code)
EN 60947-1 Low voltage switchgear
EN 60947-5-1 Control circuit devices and switching elements

Applied standards and technical specifications:

DIN VDE 0100 Part 410 Protection against electric shock
DIN VDE 0110 Insulation coordination for equipment
with low-voltage equipment

Wetter, 1 April 2004

Place and date of issue



ppa. Gersemsky
Technik HT



ppa. Hoffmann
GZ Handling-Technology #

1) Application of CE symbol in accordance with EC Low Voltage Directive 73/23/EEC:
DST, DSK, DSM5 1995; DSE 1996; DSC, DSC-M 2004

# = Modifications compared to previous issue	Normung	Class. no. 715 IS 951
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