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1. Information on This Operating Instruction

- The manual is aimed at specialists and semi-skilled personnel.
- Please read the instructions carefully before carrying out any operation and keep the specified order.
- Thoroughly read and understand the information in chapter 2 "Safety Instructions".

If you have any problems or questions, please contact your supplier or contact us directly at:



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Operating Instructions Combi Gauges for Rail Cars Models Rg...Fz, RChg...Fz, DRChg...Fz

1.1 Pictographs Used

In this manual, pictographs are used as hazard warnings.

Particular information, instructions and restrictions designed for the prevention of personal or substantial property damage:



WARNING! Is used to warn you against an imminent danger that may result in personal injury or death.

IMPORTANT! Is used to warn you against a possibly hazardous situation that may result in personal, property or environmental damage.

CAUTION! Is used to draw your attention to important recommendations to be observed. Disregarding them may result in property damage.



Passages in the text containing **explanations, information or advice** are highlighted with this pictograph.



The following symbol highlights **actions** you have to conduct or **instructions** that have to be strictly observed.

1.2 Exclusion of Liability

We accept no liability for any damage or malfunction resulting from incorrect installation, inappropriate use of the device or failure to follow the instructions in this manual.

1.3 General Information

Please inspect the transport packaging and the delivered items immediately upon their receipt to determine their integrity and completeness.

The pressure gauges for rail cars are manufactured in accordance with the standards DIN EN 837-1 and, depending on the version, DIN 38030.

They are applied in rail cars as well as other vehicles with air brake systems. Further information on the instruments can be found in the data sheets 1901 and 5901.

The following manual was composed with due care. It is not possible, however, to take into account all versions and possible cases of application in this operating instruction. If you have any questions regarding a special application, instruments, storage, mounting, operation or difficulties, please contact us as manufacturer or the distributor.

Please support us in improving this operating instruction. We will gladly accept your advice.

2. Safety Instructions



IMPORTANT! Disregarding the respective regulations may result in severe personal injuries and / or property damage.

Please read this operating instruction thoroughly before installing the device.

Disregarding the containing warnings, especially the safety instructions, may result in danger for people, the environment, and the device and the system it is connected to.

The device corresponds with the state of engineering at the time of printing. This concerns the accuracy, the operating mode and the safe operation of the device.

In order to guarantee that the device operates safely, the operator must act competently and be conscious of safety issues.

The ARMANO Messtechnik GmbH provides support for the use of its products either personally or via relevant literature. The customer verifies that our product is fit for purpose based on our technical information. The customer performs customer and application specific tests to ensure that the product is suitable for the intended use. With this verification, all hazards and risks are transferred to our customers. Our warranty expires in case of inappropriate use.

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Qualified personnel:

- The personnel that is charged for the installation, operation and maintenance of the instrument must hold a relevant qualification. This can be based on training or relevant tuition. The personnel must be aware of this manual and have access to it at all times.
- The electrical connection shall be carried out by a fully qualified electrician only.

General safety instructions:

- In all work, the existing national regulations for accident prevention and safety at the workplace must be complied with. Any internal regulations of the operator must also be complied with, even if these are not mentioned in this manual.
- Use the instrument in its perfect technical condition only. Damaged or defective instruments need to be checked immediately and replaced if necessary.
- Only use appropriate tools for mounting, connecting and dismantling the device.
- Nameplates or other information on the device shall neither be removed nor obliterated, since otherwise any warranty and manufacturer responsibility expires.
- In order to ensure measurement accuracy and durability of the instrument and to avoid damage, the limit values indicated in the technical data have to be observed.
- In case of visible damage or malfunctions, the instrument must be put out of operation immediately.


Special safety instructions:


Warnings, which are specifically relevant to individual operating procedures or activities, are to be found at the beginning of the relevant sections of this operating instruction.

The following safety equipment is included:

- Blow-out device in the back of the case
- Restrictor screw in the pressure inlet port
- Laminated safety glass
- Earth lug 6.3×0.8 for voltages > 42 V

These safety devices are intended for the protection of the operator against flying parts in a case of damage, of a defective instrument or under overpressure.

 The safety equipment must not be removed! Modifications or other technical changes of the instrument by the customer are not permitted. Otherwise, you will lose your warranty.


 Mounting and dismantling may only be carried out in an unpressurised and deenergised state. If the mains voltage exceeds 42 V, it is absolutely necessary to connect the earth lug.

3. Device Description and Application



Applications that are not explicitly listed as according to regulations, are improper to intended purpose!


Combi gauges for rail cars were specially designed for the application in air brake systems.

 The pressure gauges must only be operated and checked with compressed air with a quality of at least 3:4:3 according to ISO 8573-1.


Instrument models Rg...Fz and RChg...Fz are provided with one measuring unit for the indication of the operating pressure. Instrument models DRg...Fz and DRChg...Fz are provided with two independently working measuring units.

The measuring instruments are equipped with u-clamps for panel mounting and with direct and indirect lighting as combi gauges. Depending on the supplied specification, an instrument version with direct or indirect lighting only or without lighting is also available. Good readability is ensured by the reflex-reduced window.

The pressure connection is carried out via the connecting piece(s) according to EN 8434-1 (DIN 2353) with 24° cone. For a tube connection, cutting ring and union nut are available as accessory.

 The restrictor screw in the pressure inlet port must not be removed as safety equipment.

A voltage of 24 V is required for direct lighting.

 The direct lighting is optionally also available for voltages between 12 V and 110 V. In this case, an earth lug 6.3×0.8 is mounted to the case as protection for the operator. It is absolutely necessary to connect this earth lug.

Light bulbs and LED lamps are consumables and can be ordered separately.

The indirect lighting is provided via light slits in the case, which transfer the central lighting of the control panel to the pressure gauge. The light slits are covered with a light guide ring in the case, which not only ensures perfect illumination of the dial but also functions as dust cover and intrusion protection.

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4. Technical Data

Application	in closed rooms
Case configuration	rm
Mounting	into the panel with u-clamps
Required connection	pressure and operating voltage
Degree of protection	IP54 in front of the panel
Ambient temperature	-40 / +60 °C (-40 / +140 °F)
Special version	-50 / +60 °C (-58 / +140 °F)

NCS	Case Ø in mm	Panel cut out Ø in mm	Process connection
60	59	61 ±0.5	L6
80	79	81 ±0.5	L10
100	99	102 ±1	L10
125	125	128 ±1	L10

5. Mounting

Prior to mounting, please check the following aspects:

- Are the goods undamaged and complete?
- Do the goods match the shipping documents?
- Is the instrument suitable for the case of application?
- Does the process connection comply with the requirements?
- Does the adjustment position of the pressure gauge comply with the inclination of the control panel?
- Does the integrated lighting comply with the on-board voltage?
- Is an earth lug available for voltages > 42 V?

Mounting into the control panel:

- Remove the clamp(s) by loosening the thin or wing nut(s).
- Insert it into the panel.
- Reattach the clamp(s), fit the thin or wing nut(s) and tighten it/ them hand-tight.
- Tighten the thin nut(s) with a spanner (AF 22) by one turn.



The thin nuts at the case must not be removed. They also must not be used for holding up while tightening the clamp. Otherwise, the measuring unit within the device might be damaged, which might falsify the indication.

The pressure connections are manufactured according to DIN EN ISO 8434-1. Its mounting as tube connection or hose connection (pre-assembled screwed connecting piece) is described in detail in the annex of this standard.

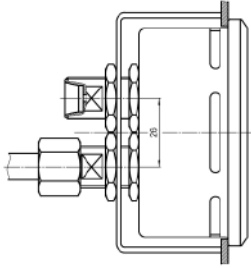
Pressure connection for tube connection:

- Place the union nut(s) onto the right-angled deburred tube end(s).
- Slide the cutting ring(s) with the cutting edge towards the tube end(s).
- Tighten the tube connection(s) at the connection(s) manually.
- Tighten the union nut(s) by 1½ turns while holding up the pressure gauge connecting piece with a second spanner (AF 8 for L6 or AF 13 for L10).

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Pressure connection with pre-assembled screwed connecting piece (e.g. for hose connection):


- Place the tube end onto the pressure gauge connection(s) and tighten it hand-tight.
- Tighten the union nut(s) by another ¼ turn while holding up the pressure gauge connecting piece with a second spanner (AF 8 for L6 or AF 13 for L10).



The pressure connections are marked with a colour dot at the connection, matching the colour of the corresponding pointer.

The following applies:

- upper pressure connection – rear pointer
- lower pressure connection – front pointer

 When connecting the pressure gauge, do not exert any force on the case. Hold up at the spanner flat of the pressure connection.


Installation of the power supply for direct lighting:

Standard: blade receptacle

- Plug the grounding with blade receptacle onto the earth lug (if available).
- Plug the power supply with two blade receptacles 6.3×0.8 onto the socket (the polarity does not have to be considered – reverse polarity protected).

Optional: screwed socket

- Loosen the screws and fasten the prepared cable.

 For lighting tests, the connected lighting can be pulled out of the pressure gauge with its socket.

6. Operation

Safe operation is ensured if the device has been properly connected.

If the adjusted position of installation deviates from the inclination angle of the control panel, measuring errors may occur.

A separate switch-on of the light bulb / LED lamp is not required.

The operation temperatures correspond to the storage temperatures. In case of ambient temperatures deviating from 20 °C, increased inaccuracies may occur.

7. Maintenance / Cleaning, Storage and Transport



CAUTION! Material damage and loss of warranty!

Any modifications or interventions in the device, made by the customer, might damage important parts or components. Such intervention leads to the loss of any warranty and manufacturer's responsibility!

→ Never modify the device or perform any repairs yourself.

Maintenance:

Pressure measuring instruments are generally maintenance-free.

To assure the accuracy of measurement, we recommend a regular examination of the instrument. For this, the instrument needs to be separated from the system.

Repairs may only be executed by the manufacturer.

Cleaning:

Cleaning can be carried out together with the cleaning of the control panel. No special measures are necessary.

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Storage and Transport:

Please keep the pressure measuring instruments in its original packaging until mounting and store them protected against damage due to external influences.

If a measuring instrument was removed (e.g. for testing), it should be carefully placed back in its original packaging for further storage.

In general, the storage temperature should not fall below or exceed the temperature limitations of -40 °C and $+70\text{ °C}$ (\Rightarrow DIN EN 837-1 and DIN EN 837-3).

8. Dismounting and Disposal



WARNING! Risk of injury!

Never remove the device from a system in operation.

Make sure that the system is switched off professionally.

Before dismounting:

Check before dismounting, whether the system

- is switched off,
- is in a safe and currentless state,
- is unpressurised and cooled down.

Disposal:



Please help protecting the environment and dispose of the used materials according to the valid regulations or to recycle them.

9. CE Conformity

Pressure measuring instruments with upper range values $>0.5\text{ bar}$ and $<200\text{ bar}$, which are subject to article 4 paragraph 3 of the Pressure Equipment Directive (PED) 2014/68/EU, and do thus **not receive a CE-marking**, are delivered without a specific marking as hitherto.

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