



MNR 300-FL2700

manual pressure controller

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M O D I F I C A T I O N

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Date:	Date:	



High pressure liquids and gases are potentially hazardous. Energy stored in these liquids and gases can be released unexpectedly and with extreme force. High pressure systems should be assembled and operated only by personnel who have been instructed in proper safety practices.



This instrument is not to be operated in any other manner than that specified by the manufacturer.



The MNR 300-FL2700 is intended to be used by educated personell only who are familiar with high pressure and understand the risks involved with that.



The MNR 300-FL2700 is equipped with two 1 litre steel high pressure gas bottles which require special treatment and operation. Only staff trained in pneumatic safety and testing of high gas pressures should recharge and operate the instrument.

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1. introduction

The MNR 300-FL2700 pneumatic portable calibrator is designed for the supply and measurement of high pneumatic pressures. It can be used for calibrating and testing of gauges, pressure transducers etcetera.

Inside the sturdy enclosure two 1 litre steel gas bottles are mounted which can be filled till 280 bar. This makes it possible to use the instrument on-site independent from pressure sources.

2. technical specifications

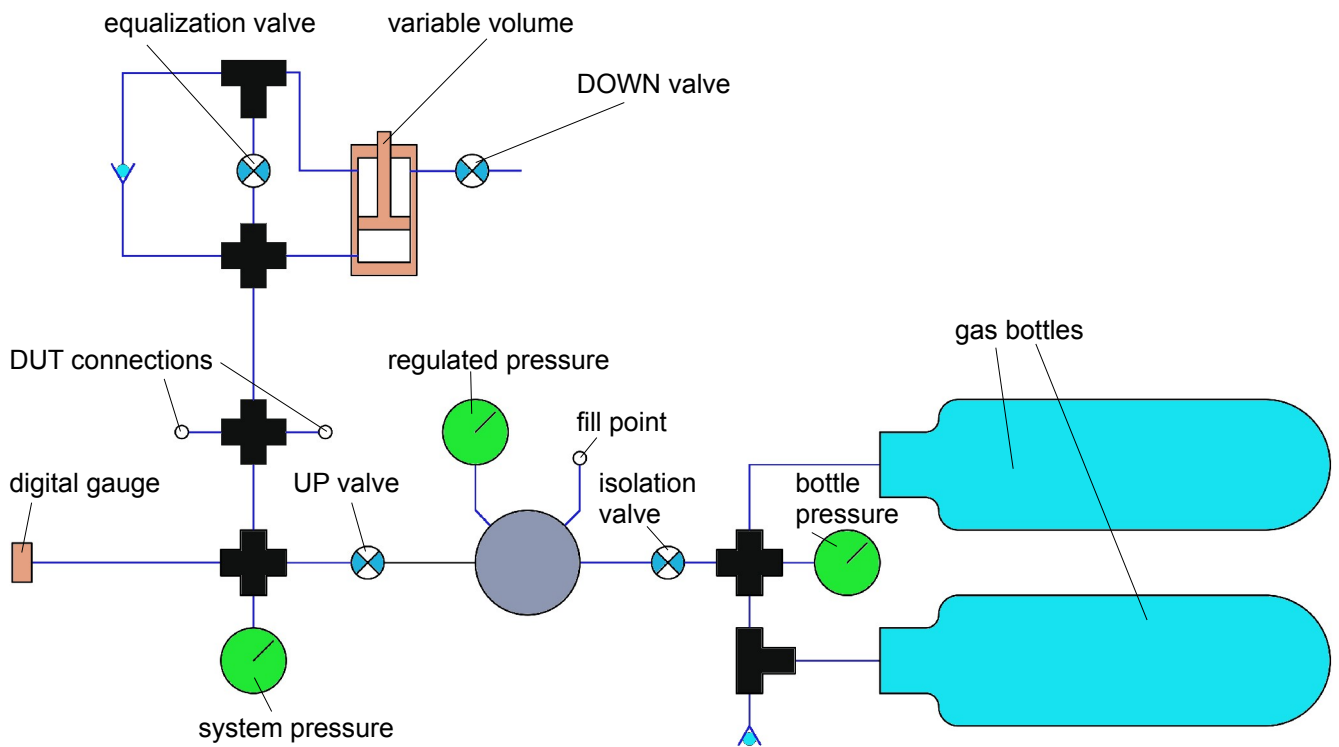
gas bottle	material	: steel	
	volume	: 1	litre (2x)
	pressure rating	: 300	bar
	charge limit	: 280	bar
	charge connection	: MM1215	
	re-test interval	: 10	year (recommended 5)
	max. controllable pressure	: 250	bar
	control functionality	: pressure regulator	(coarse)
		: variable volume	(fine)
		: up- & down regulating valve	
	test connections	: MM1215 (2x)	
	reference instrument	: GE DPI 620 + PM 620 module	
	overall weight	: 23	kg
	outer dimensions	: 524 x 428 x 206	mm

2.1 *CE Pressure Equipment Directive 97/23/CE*

The MNR 300-FL2700 meets the essential safety regulations as mentioned in appendix 1 of the European guideline 97/23/EG of 29 may 1997.

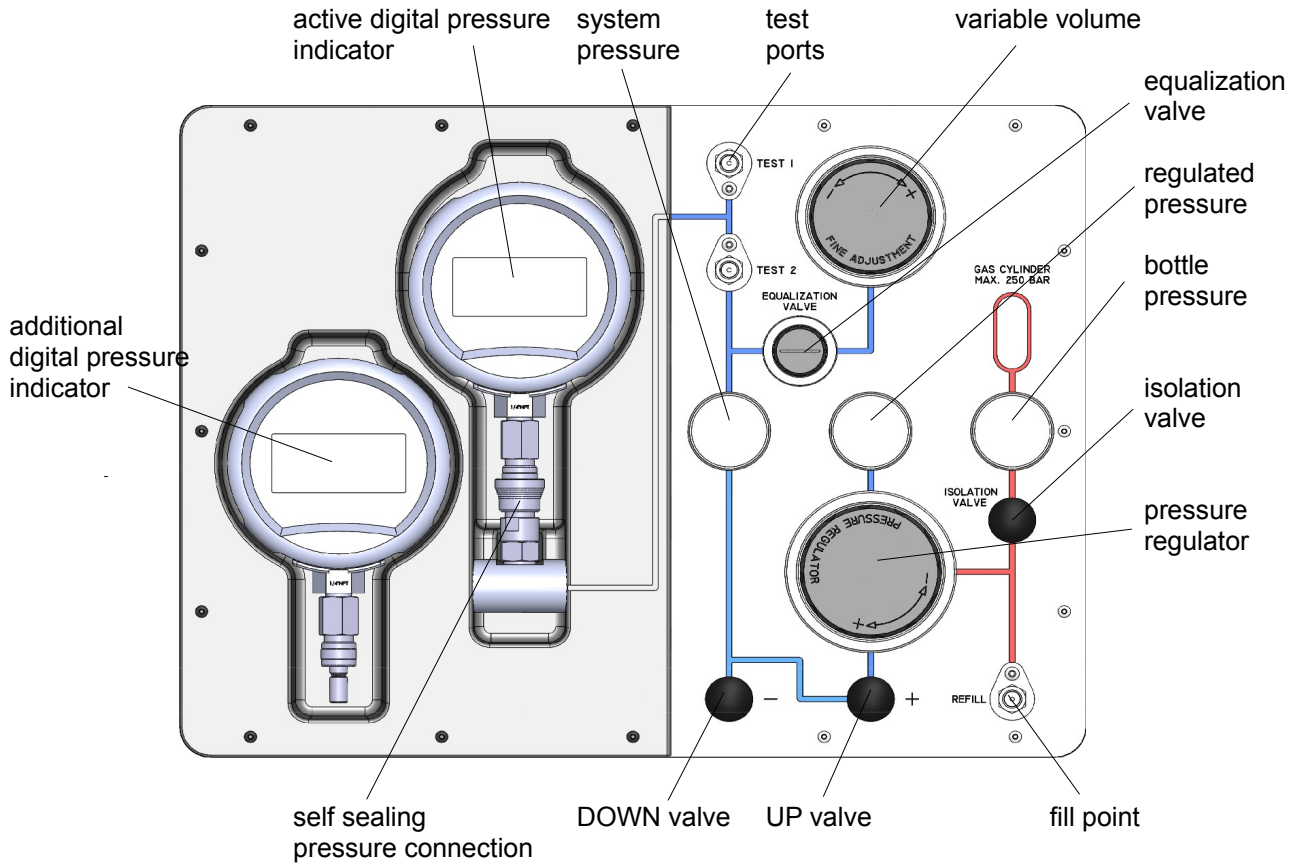
The MNR 300-FL2700 is a combination of different pressure component as mentioned in article 1 paragraph 2.1.5

3. schematic



4. operating instructions

4.1 front panel layout



4.2 installation

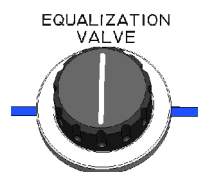
- place the calibrator on a flat and level surface
- check the calibrator for external damage
- unlock the instrument and open the lid
- visually inspect the instrument especially the gauges and appendages
- check the test hose for damages and proper pressure rating



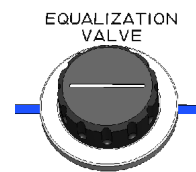
Make sure this equipment is used, operated and maintained by authorized and properly trained personnel only.

4.3 preparing the equipment for use

- close the UP needle valve
- decrease the regulated pressure by rotating the pressure regulator knob counter clockwise to its ZERO position
- deactivate the variable volume by setting the equalization valve in its blocked position



blocked position



inline position

- open the DOWN- valve to vent the instrument
- select the digital pressure gauge of choice and push it in its self sealing pressure connection



Make sure there is no pressure present when connecting the digital pressure gauge

- check the bottle pressure by means of the gas bottle pressure gauge
- fill the bottle if necessary until max. 250 bar as described in section 5
- connect the instrument under test to one of the test connections

4.4 using the MNR 300-FL2700

The MNR 300-FL2700 is a manual pressure controller to adjust and regulate pressures till 250 bar. The calibrator is equipped with a high pressure regulator and built in gas bottles which can be charged till 250 bar. On the output side of the pressure regulator two valves are fitted a DOWN- and UP+ valve. In combination with the built in variable volume the operator can set pressures with a very high resolution.

4.5 *leak test*

Turn the pressure regulator fully anti-clockwise to its start position in order to make the test circuit pressure zero. Check if the supply pressure is sufficient for performing the test, if necessary fill the MNR 300-FL2700 according to the filling procedure as described in section 5 up to max. 250 bar.

Before connecting anything make sure the test circuit is vented.



- close the isolation valve
- close the UP needle valve
- set the equalization valve in its blocked position
- open the DOWN- valve
- turn the pressure regulator knob fully counterclockwise

Connect the instrument under test to one of the the test connections by means of an appropriate test hose.

- close the DOWN- valve
- open the isolation valve
- set the pressure regulator (clockwise = up) to the maximum allowable pressure of the instrument to be tested. This prevents damaging the instrument under test by a pressure shock or an overpressure event.
- open the UP+ valve and slowly increase the pressure till the desired setpoint
- close the UP+ valve

Monitor the digital pressure gauge reading for any pressure loss. Please remember that after an upwards pressure step initially the pressure will drop a littlebit due to adiabatic effects.

If there is a leak, vent the MNR 300-FL2700 by :

- close the isolation valve
- rotate the pressure regulator knob fully counterclockwise
- set the equalization valve in its blocked position if applicable
- open the DOWN valve
- open the UP valve

The general rule for finding the source of a leak is trying to exclude parts of the measuring circuit. For example perform the same leak check with the MNR 300-FL2700 without any instrument under test. If no leak is detected you can exclude the MNR 300-FL2700 as the source of the leak.

4.6 *performing a calibration*

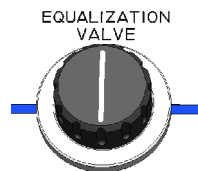
- perform a leak test as described in 4.5 and end up in vent conditions.
- check if the supply pressure is sufficient for performing the test, if necessary fill the MNR 300-FL2700 according to the filling procedure as described in section 5 up to max. 250 bar.
- connect the instrument under test to one of the the test connections by means of an appropriate hose.
- open the DOWN- valve and close the UP+ valve
- open the isolation valve.
- slowly turn the pressure regulator knob clockwise to approximately 105 % of the desired measurement point of your procedure.



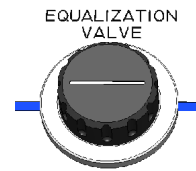
This step is performed to prevent possible damage to the instrument under test by a pressure spike.

In case of increasing pressure steps :

- close the DOWN- valve
- set the equalization valve in its blocked position if applicable
- slowly open the UP+ valve until the digital pressure indicator reading is approximately indicating the desired pressure. When this is reached, close the UP+ valve again.
- activate the variable volume by setting the equalization valve inline



blocked position

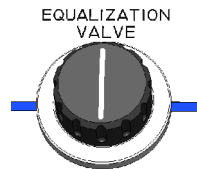


inline position

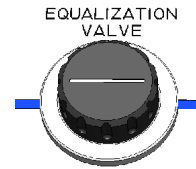
- manipulate the variable volume until the desired pressure is reached
- record the measurement data
- before going to the next step set the equalization valve in its blocked position

In case of decreasing pressure steps :

- close the UP+ valve
- set the equalization valve in its blocked position if applicable
- slowly open the DOWN- valve to lower the pressure until the digital pressure indicator reading is approximately indicating the desired pressure. When this is reached, close the DOWN- valve again.
- activate the variable volume by setting the equalization valve inline



blocked position



inline position

- manipulate the variable volume until the desired pressure is reached
- record the measurement data
- before going to the next step set the equalization valve in its blocked position

Perform the above mentioned procedure for all measurements required for the instrument to be calibrated.

When finished vent the system by :

- close the isolation valve
- rotate the pressure regulator knob fully counterclockwise
- set the equalization valve in its blocked position if applicable
- open the DOWN- valve
- open the UP+ valve
- disconnect the instrument to be tested

5 filling procedure

Filling the built-in gas bottle can be done either by means of connecting a (large) Nitrogen bottle or by means of a high pressure gas booster. Maximum charging pressure is 250 bar, recommended gas is Nitrogen.



The MNR 300-FL2700 is equipped with two 1 litre steel high pressure gas bottles which require special treatment and operation. Only staff trained in pneumatic safety and testing of high gas pressures should recharge and operate the instrument.

- close the isolation valve
- turn the pressure regulator fully anticlockwise
- check the filling hose on defects and damage

>>If the hose is damaged, replace it for a new one<<

- connect the filling hose to the CHARGE pressure connection
- set the supply gas booster or bottle pressure regulator to max. 250 bar
- open the isolation valve gradually

The built in gas bottle will now be filled, actual bottle pressure is indicated on the bottle pressure gauge.

Fill the gas bottle slowly, because filling will cause a temperature increase of the gas medium, appendages and gas bottles. A temperature increase will result in not fully charged gas bottles.

- close the isolation valve
- close the supply bottle or stop the high pressure compressor
- vent the filling hose
- remove and store the filling hose

6 storage

- disconnect the instrument under test as described before
- set the equalization valve in its blocked position if applicable
- open the DOWN valve
- close all other valves
- close the MNR 300-FL2700 lid

7. transport

Always make sure that transport of the MNR 300-FL2700 complies with the local rules and regulations for transport of potential dangerous goods of the country, state or province where the transport takes place.

Before shipping decrease the system pressure to zero by :

- close the isolation valve
- rotate the pressure regulator knob counterclockwise
- set the equalization valve in its blocked position if applicable
- open the DOWN valve
- open the UP valve
- close the enclosure lid

8. calibration and maintenance

8.1 calibration

The MNR 300-FL2700 itself does not contain parts which need recalibration. A periodic functionality test of the analog gauges is sufficient.

8.2 general maintenance


Check the MNR 300-FL2700 for any possible defects on :

- enclosure
 - check the enclosure on damages and keep it clean with a non-aggressive and non-synthetic cleaner
- test connections
 - check the test connection on damages of the thread / damaged test connections must be replaced immediately
- needle valves
 - check whether the needle valves can be opened and closed smoothly
- filling and test hoses
 - if hoses show any sign of damage / knicks they should be replaced immediately

8.3 *internal gas bottles*

Every 10 years the high pressure gas bottles should be re-certified. Do not use the MNR 300-FL2700 when the certification of the high pressure cylinder has been voided or that the label has been removed from the enclosure.

gas bottle information	
type	
serial number	



manufacturer	EUROCYLINDER SYSTEMS AG	
manufacturing date		
next examination		
pressure fluid	nitrogen	
maximum filling pressure	300	bar
safety relief valve	280	bar
material	34CrMo4	
volume per gas bottle	1	litre
serial number(s)		
empty weight		

9. warranty

During the design and manufacturing of this instrument the utmost attention has been given to quality and durability.

This manual contains information needed for the safe and effective use of the capabilities of the instrument. Please read the manual carefully before operating the instrument. By doing so possible damage to the instrument or damage caused by the incorrect use of the instrument can be avoided.

Minerva meettechniek B.V. warrants the instrument in accordance with the Standard Terms and Conditions of the Instrument Trade as issued by the Association bearing the name "Federation Het Instrument" (The Instrument federation), filed with the Clerk of Utrecht District Court on 13 January 1993 under number 16/93 and with the Chamber of Commerce and Industry in Amerfoort on 18 January 1993. A copy is available on request.

Minerva meettechniek B.V. warrants that this product will be free from defects in materials and workmanship for a period of 12 months from the date of shipment. If any such product proves defective during this warranty period, Minerva meettechniek B.V., at its option, will either repair the defective product without charge for parts or labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, The customer must notify Minerva meettechniek B.V. of the defect before the expiration of the warranty period and make suitable arrangements for the execution of the service.

The customer shall be responsible for packaging and shipping of the defective product to the service centre designated by Minerva meettechniek B.V, with shipping charges prepaid.

If no defect can be found the customer can be charged for costs of the investigation.

This warranty shall not apply to any defect, failure or damage caused by :

- a. improper use of the instrument.
- b. normal wear of the product.
- c. modification or repair carried out by or on behalf of the owner or by a third party
- d. modifications to the product that are not supplied or implemented by Minerva meettechniek B.V.

Minerva meettechniek B.V. and its distributors will not be liable for any indirect, special, incidental or consequential damages irrespective of whether Minerva meettechniek B.V. or the vendor has advance notice of the possibility of such damages.

The type number and serial number of the product, as listed on the instrument, should always be mentioned in any correspondence concerning the product.

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