

EXPANSION VESSELS



Operating Manual





EC DECLARATION OF CONFORMITY

AT UYGUNLUK BEYANI

Manufacturer / İmalatçı : MAS DAF MAKİNA SANAYİ A.Ş.

Address / Adres : Aydınlı Mah. Birlik OSB. 1.No'lu Cadde No:17 Tuzla - İSTANBUL / TÜRKİYE

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The undersigned Company certifies under its sole responsibility that the item of equipment specified below has been designed, manufactured, inspected and tested as required by the relevant provisions of the Pressure Equipment Directive 2014 / 68 / EU.

The item of equipment identified below has been subject to EC Type Examination (Pressure Equipment Directive additional III Module H1) by TUV AUSTRIA (notified body number 0408), which has issued the certificate.

Aşağıda tanımlanmış olan ürünlerin, Basınçlı Ekipmanlar Direktifi 2014 / 68 / EU 'nın ilgili hükümlerine göre tasarlandığı, üretildiği, kontrol ve test edildiği, aşağıda imzası bulunan şirketin kendi sorumluluğu altında onaylıdır.

Aşağıda tanımlanmış ekipmanlar, Yetkili Ana Kuruluş (Yetkili Kuruluş Numarası: 0408) olan TUV AUSTRIA tarafından AT tipi incelemeye (Basınçlı Ekipmanlar Direktifi, ek III modül H1 'e göre tabi tutulmuş ve ZSTS/SWZE/1808 sertifikasıyla yayımlanmıştır.

Equipment / Ürün : EXPANSION VESSELS / GENLEŞME TANKLARI

Seri / Model-Tip : TH 8 / TH 12 / TH 16 / TH 25 / TH 40 / TH 50 / TH 60 / TH 80 /
T 8 / T 12 / T 16 / T 20 / T 25 / T 40 / T 50 /
TM 60 / TM 80 / TM 100 / TM 110 / TM 200 / TM 300 / TM 500 / TM 750 / TM 1000 /
TM 1500 / TM 2000 / TM 2500 / TM 3000 / TM 4000 / TM 5000 /
TR 110 / TR 200 / TR 300 / TR 500 / TR 750 / TR 1000

Related Directives / Yönetmelikler

2014/68/EU Pressure Equipment Directive / Basınçlı Ekipmanlar Direktifi

Regulations applied acc. to harmonize standards / Uygulanan Uyumlaştırılmış Standartlar

TS EN ISO 13831:2010, EN 13445-3

Procedures specified in the MAS DAF Makina Sanayi A.S. Quality System Certificate EN ISO 9001:2015 (TUV AUSTRIA - certified no: 20100183004908)

Prosedürleri MAS DAF Makina Sanayi A.Ş. 'de belirtilen, EN ISO 9001:2015 (TUV AUSTRIA - sertifika no: 20100183004908) Kalite Sistem Belgesi.

Place and date of issue / Yer ve Tarih

: İstanbul, 23.08.2019

Name and position of authorized person

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Yetkili Kişinin İmzası



Expansion Vessels

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INTRODUCTION



- This leaflet includes technical characteristics and information needed and suggestions for installation and commission of all the series of the closed vessels with diaphragm that **MAS DAF MAKINA SANAYI A.Ş.** manufactures.
- Do read this leaflet carefully beforehand to ensure the vessels to work matterlessly and apply all the advices included exactly. This leaflet, also, covers operation conditions, installation and commission.
- These instructions over operation and maintenance include **MAS DAF MAKINA SANAYI A.Ş.**'s suggestions. The information about commission and maintenance of vessels installed must be received from personnel in charge of system-making and planning (system manufacturer).
- **Please see the system manufacturer's instructions over operation.**
- Do follow these instructions perfectly and ensure that this leaflet is read before installation and commission. **MAS DAF MAKINA SANAYI A.Ş.** will not be responsible for the accidents caused by negligence and its consequences.
- Do ask for help out of authorized customer services of **MAS DAF MAKINA SANAYI A.Ş.** if you cannot find the information that you need in this leaflet, and give all the values on the label.
- This leaflet covers all the safety precautions and regulations of national precautions against accidents. In addition to that the user should take their own precautions for operation and work safety.

The Signs Used in This



Read the instructions carefully and keep the book in case you need it again.



The warning sign for user.



1. IMPORTANT SAFETY PRECAUTIONS

The instructions must be applied to avoid the work accidents that may occur during installation and commission. Please,

1. Do not start working without taking precautions related to the equipment. Use rope or safety tape if necessary.
2. Ensure that there is enough oxygen and no poisonous gas in the ambience.
3. Do control the cleanliness of the ambience not to take risks with your health (dust, smoke, etc.).
4. Do not move the vessel without checking the carrier equipment (crane, rope...)
5. Do wear goggles, helmet and protective shoes for safety.
6. Do work in safety area provided.
7. Follow the instructions about carrying and storing.

Follow all the Regulations and Law about Health and Safety

2. GENERAL

2.1. Description and Use of Expansion Vessels

The vessels manufactured by **MAS DAF MAKINA SANAYI A.Ş.** are capable of working economically and efficiently for a long time if installed the way described and used according to the instructions covered in this leaflet.

MAS DAF MAKINA SANAYI A.Ş.'s vessels with interchangeable membrane can be used for two different aims, which are;

- to compensate the water expanded by heat in heating systems,
- to prevent the heating pump in the system to operate on and off too often.

MAS DAF MAKINA SANAYI A.Ş.'s vessels must be used appropriately to the design and technical specifications. The responsibility for the problems caused by users misusing the vessels in the system does not belong to the manufacturer.

Not following the instructions in the leaflet may harm your health and possessions safety. Please contact our authorized customer services when service or reparation is needed.

Expansion Vessel Labels



MAS DAF MAK. SAN. AŞ.

1. Organize Sanayi Bölgesi Parsel 249/5

Beyköy DÜZCE

Tel : +90 216 456 47 00

Fax : +90 216 456 14 24

www.masgrup.com

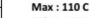
GENLEŞME TANKI
(EXPANSION VESSEL)

TB - 25
KAPASİTE
Capacity
25 LT / (V)

MADE IN TURKEY

CE 0408	T S E	Max.Basınç:PS: (Max.Pressure)	6 BAR	SICAKLIK (Temperature) Max : 110 C Min : -10 C	↓	
		Test Basınç:Pt: (Test Pressure)				8.58 BAR
		Ön Dolum Min (Precharge)				2 BAR
		Seri NO: (Serial No)				F 19090147
EN 13831						
İMALAT YILI/DÖNEMİ Product year 2019/09						

 MAS DAF MAK. SAN. AŞ.				GENLEŞME TANKI (EXPANSION VESSEL)	
1.Organize Sanayi Bölgesi Parsel 249/5 Beyköy DÜZCE Tel :+90 216 456 47 00 Fax :+90 216 456 14 24 www.masgrup.com				TM - 50 KAPASİTE Capacity 50 LT / (V)	
				MADE IN TURKEY	
 0408	T S	Max.Basınç:PS: (Max.Pressure)	10	BAR	SICAKLIK (Temperature) Max : 110 C Min : -10 C 
	E	Test Basınç:Pt: (Test Pressure)	14.3	BAR	
	EN 13831	Ön Dolum Min (Precharge)	2	BAR	
	İMALAT YILI/DÖNEMİ Product year 2019/09	SERİ NO: (Serial No)	F 19090148		

 MAS DAF MAK. SAN. AŞ.				GENLEŞME TANKI (EXPANSION VESSEL)		
1.Organize Sanayi Bölgesi Parsel 249/5				TH - 50		
Beyköy DÜZCE				KAPASİTE		
Tel :+90 216 456 47 00				Capacity		
Fax :+90 216 456 14 24				50 LT / (V)		
www.masgrup.com.tr				MADE IN TURKEY		
 0408	T S E	Max.Basınç:PS: (Max.Pressure)		10	SICAKLIK (Temperature)	
		10 BAR				
		Test Basınç:Pt: (Test Pressure)		14.3	BAR	Max : 110 C Min : -10 C
		14.3 BAR				
Ön Dolum Min (Precharge)		2	BAR			
SERİ NO : (Serial No)		F 19090149				
İMALAT YILI/DÖNEMİ Product year 2019/09						



MAS DAF MAK. SAN. AŞ.

1.Organize Sanayi Bölgesi Parsel 249/5
Beyköy DÜZCE
Tel :+90 216 456 47 00
Fax :+90 216 456 14 24
www.masgrup.com

GENLEŞME TANKI
(EXPANSION VESSEL)

TM - 500
KAPASİTE
Capacity
500 LT / (V)
MADE IN TURKEY

CE 0408 EN 13831 İMALAT YILI/DÖNEMİ Product year 2019/09	TS E	Max.Basınç:PS: (Max.Pressure)		10	BAR	SICAKLIK (Temperature) Max : 110 C Min : -10 C ↓
		Test Basınç:Pt: (Test Pressure)		14.3	BAR	
		Ön Dolum Min (Precharge)		2	BAR	
		SERİ NO: (Serial No)		F 19090150		

 MAS DAF MAK. SAN. AŞ.				GENLEŞME TANKI (EXPANSION VESSEL)	
1.Organize Sanayi Bölgesi Parsel 249/5				TM - 1500 KAPASİTE	
Beyköy DÜZCE				Capacity	
Tel :+90 216 456 47 00				1500 LT / (V)	
Fax :+90 216 456 14 24				MADE IN TURKEY	
www.masgrup.com					
 0408	T S E	Max.Basınç:PS: (Max.Pressure)		10	BAR
		Test Basınç:Pt: (Test Pressure)		14.3	BAR
		Ön Dolum Min (Precharge)		2	BAR
		Seri NO: (Serial No)		F 19090151	
İMALAT YILI/DÖNEMİ Product year 2019/09				Max : 110 C Min : -10 C	
					

2.2. Terms of Warranty

DAF brand expansion vessels suitable for standards are warranted against material and manufacturing faults as long as the instructions on installation, commission and maintenance are followed fully.

2.3. Test

The closed vessels are tested by the operation pressure multiplied by 1,5 to check if there is leakage out of the vessels.

CAUTION

When the expansion tank to be tested must be absolutely removed the air in the tank and must be drained the membrane.

2.4. Pressure Limit



The operation and maximum pressures of the vessels are on the labels.



Please, read the information on the label before and during using the vessels.

3. CONDITIONS FOR SAFE OPERATION

This leaflet includes basic instructions of safety, installation, operation and maintenance. Before installation and operation, it must be read by all the personnel of the customers and kept close to the installation ambience. General safety instructions must be followed as well as the important safety precautions explained on the first page and in the other parts.



The vessels with interchangeable membrane must not be operated by connecting to coal-boilers.

3.1. Personnel Training

The personnel of operation, maintenance and installation must be trained about the product to fulfill their duties. The personnel's responsibilities, abilities and control duties must be clarified by the customer and the personnel must understand the context in the operation leaflet. If personnel do not have enough information about the product, operator should train the personnel. If required, manufacturer or retailer will provide training on operator's behalf.

CAUTION

Negligence of safety precautions and untrained personnel may risk their health and as well as machinery and work environment. **MAS DAF MAKINA SANAYİ A.Ş.** is not responsible for the damage that may happen in these circumstances.

3.2. Hazards that may occur in the circumstances of negligence of safety instructions

Negligence of safety precautions may put people, work environment and installation into risks and cause damages. Negligence of safety precautions may cause those below:

- The important functions of factory may stop
- The methods applied for maintenance and installation may fail.

3.3. Safety Precautions for Maintenance and Installation

Operator firm must ensure authorized and qualified personnel to do all the maintenance, control and installation, itable for the operation instructions. Before operating the system on, the instructions for operation

must be applied.

3.4. Replacement of Parts

Replacement or modification of the parts must be done after interviewing the manufacturer. The parts that will be replaced and the accessories must be approved by the manufacturer, which is very important in terms of safety. No other parts must be used apart from the original ones provided by **MAS DAF MAKINA SANAYİ A.Ş.**

The use of unsuitable parts in the system is not **MAS DAF MAKINA SANAYİ A.Ş.**'s responsibility.

4. GENERAL INFORMATION

The vessels contain hygienic BUTYL material interchangeable membrane in plumbing and EPDM in heating-cooling systems and around the interchangeable membrane there is pressurized nitrogen gas. The vessels for plumbing, sized 200 lt and over are delivered with a manometer displaying gas pressure. Standard preliminary gas pressures of vessels are as 1,5 Bar.

The exterior surface of the vessels is covered by electrostatic paint to prevent corrosion. Because the inner surface of the vessels does not contact the water as long as the interchangeable membrane is not torn, there is no risk of corrosion inside.

Under normal operation conditions terms (no particle in plumbing water and heating-pump's optimum number of "on" and "off"), the vessels are long-lived.

CAUTION

Whilst carrying vessels with or without package, watch out not to damage vessels.



Keep vessels in a clean and dry place throughout storage.

5. OPERATION PRINCIPLE

Increasing pressure in plumbing pushes water into interchangeable membrane against gas pressure, and vessel expands. So that some of the water will be pressurized and stored in the vessel. During dropping of pressure, the water in the vessel will be forced to the plumbing by the gas pressure around the interchangeable membrane. Water expanded by temperature increasing in the plumbing in heating and cooling systems, moves into the interchangeable membrane against gas pressure and vessel expands. Therefore, the water in the system will always be kept under a certain and constant pressure, and in spite of this, it is able to expand.

6. INSTALLATION OF EXPANSION VESSEL AND WHAT TO TAKE INTO CONSIDERATION

Whilst choosing the place to install the vessels, enough space must be kept around them in case of needing of service and reparation. Big sized vessels must be fixed to the ground by bolts.

CAUTION

During replacement or reparation of the interchangeable membranes the vessels might be tipped, so, do not fix the vessels by burying in concrete.

In booster applications, closed vessels must be connected to the plumbing by using a ball valve at discharge side and a flexible connection suitable for operation pressure or disconnectable pipe at suction side.

Expansion vessels must be connected to the discharge collector somewhere on discharge side close to the booster.

Between the valve at discharge side and the vessel, installing a drain valve makes the operation easier without disconnecting the vessel, the water in it can be drained and preliminary gas pressure can be checked.

7. TRANSPORT

Expansion vessel group must be carried safely to the installation location by lifting equipments.

Current general lifting safety instructions must be applied. The tank is transported with packaged according to volume.

Incorrect lifting may damage the pump unit and cause injuries

8. COMMISSION

Before operating the vessels on, the suitability of preliminary gas pressure to system pressure must be checked. It must be controlled before filling the vessel with water. Preliminary gas pressure in the vessel,

P_0 , should be: $P_0 = 0,9 \times H$

H: Pressure that booster starts on.

The pressure of expansion vessels should be 10% less than booster's pressure.

Precharge pressure on heating and cooling systems must be as much as the static pressure of the system.

Precharge pressure (bar) = Elevation from boiler room up to the highest fitted heating panel (m) / 10

If the vessels need to be pressured, use an appropriate compresor to fill the vessels with dry air.

9. CONTROLS AND MAINTENANCE DURING COMMISSION

Throughout the use of the vessels, preliminary gas pressure should be checked at least once a year, in preference every 6 months. Apart from periodic controls, the vessels do not need any other controls.

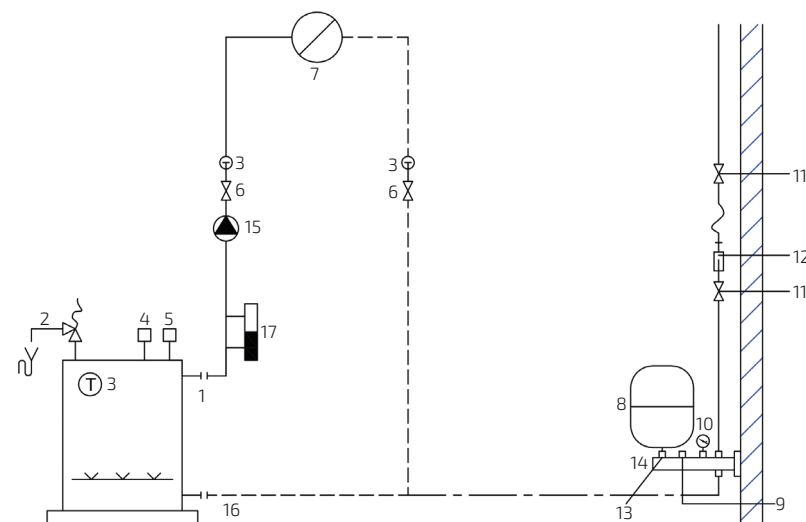


Whilst checking preliminary gas pressure and filling the vessel with air, the water in the vessel must be drained.

9.1. Service

Customer Service Department provides the users with service after sale. Installation or replacement of interchangeable membrane must be done by authorized and trained personnel.

12. SAMPLE INSTALLATION (B)



1- ATMOSHERIC BURNERED BOILER	10- MANOMETER
2- SAFETY VALVE	11- VALVE R1/2"
3- THERMOMETER	12- CHECK VALVE R1/2"
4- BOILER THERMOSTAT	13- COLLECTOR CONNECTION
5- TEMPERATOR SENSOR	14- COLLECTOR
6- VALVE	15- CIRCULATION PUMP
7- USERS	16- RELIEF VALVE
8- CLOSED EXPANSION VESSEL WITH DIAPHRAGM	17- DRY RUN PROTECTION
9- AIR RELIEF COCK R3/8"	

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