

TEST RAPORU / TEST REPORT

Rapor No / Report Number: GARB-821158-01-TR-01

Ürün Adı / Product Name : Gaz Basınç Regülatörü
Gas Pressure Regulator

Tip Tanımı / Type Definition : GSR-M, GSR-B ve GTR Serisi Gaz Basınç Regülatörleri
GSR-M, GSR-B and GTR Series Gas Pressure Regulators

Firma Adı / Adresi / Company Name / Address : GAZKON ENERJİ SİSTEMLERİ DANIŞMANLIK SAN. ve TİC. LTD. ŞTİ.
FERHATPAŞA MAHALLESİ 16. SK. NO: 53 A/O ATAŞEHİR / İSTANBUL

Üretici / Manufacturer : GAZKON ENERJİ SİSTEMLERİ DANIŞMANLIK SAN. ve TİC. LTD. ŞTİ.
FERHATPAŞA MAHALLESİ 16. SK. NO: 53 A/O ATAŞEHİR / İSTANBUL



Tarih / Date
09.12.2021

Teknik Uzman / Technical Expert
Cihan DEVA

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Testler bu belgelere dayanarak yapılmıştır: - Sözleşme No: GARB-821158-01

Tests are performed according to mentioned documents – Contract Number: GARB-821158-01

I. Ürün tanımı / Product Definition

GTR/GSR-MX20, GTR/GSR-M20, GTR/GSR-B60, GTR/GSR-B6, GTR/GSR-B10, GTR/GSR-B25

Temel teknik veriler:
Basic Technical Datas

Tablo 1 / Table 1

CİHAZ TİPİ PRODUCT TYPE	GTR/GSR- M6 MX6	GTR/GSR- M10 MX10	GTR/GSR- M20 MX20	GTR/GSR- M25 MX25	GTR/GSR- M30 MX30	GTR/GSR- B6	GTR/GSR- B10	GTR/GSR- B25	GTR/GSR- B50 BX50	GTR/GSR- B60 BX60	GTR/GSR- B75 BX75	GTR/GSR- B90 BX90
Anma Debisi Flow Rate	6 m ³ /h	10 m ³ /h	20 m ³ /h	25 m ³ /h	30 m ³ /h	6 m ³ /h	10 m ³ /h	25 m ³ /h	30 m ³ /h	60 m ³ /h	75 m ³ /h	90 m ³ /h
Giriş Basıncı, Pg Inlet Pressure	0,5-5 bar	0,5-5 bar	0,5-5 bar	0,5-5 bar	1-5 bar	0,5-4 bar	0,5-4 bar	0,5-4 bar	1,5-5 bar	1,5-5 bar	1,5-5 bar	1,5-5 bar
Çıkış Basıncı, Pç Outlet Pressure	21 mbar	21 mbar	21 mbar	21 mbar	300 mbar	21 mbar	21 mbar	21 mbar	21 mbar	300 mbar	300 mbar	300 mbar
Tahliye Değeri, mbar Relief Pressure	35 mbar	35 mbar	35 mbar	35 mbar	400 mbar	45 mbar	45 mbar	45 mbar	35 mbar	400 mbar	380 mbar	380 mbar
Çalışma ve Kapama Hassasiyeti Working and Shut-off Class	RG10/SG20	RG10/SG20	RG10/SG20	RG10/SG20	RG10/SG20	RG5/SG20	RG5/SG20	RG5/SG20	RG10/SG20	RG10/SG20	RG10/SG20	RG10/SG20
Yüzey İşlemi Surface Treatment	Kumlama Sandblasting	Kumlama Sandblasting	Kumlama Sandblasting	Kumlama Sandblasting	Kumlama Sandblasting	Kumlama Sandblasting	Kumlama Sandblasting	Kumlama Sandblasting	Kumlama Sandblasting	Kumlama Sandblasting	Kumlama Sandblasting	Kumlama Sandblasting
Giriş Bağlantısı Inlet Connection	¼"	¼"	¼"	¼"	¼"	¼"	¼"	¼"	¼"	¼"	¼"	¼"
Çıkış Bağlantısı Outlet Connection	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)	1 ¼" (Z11 veya / or Z14)

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SZUTEST Uygunluk Değerlendirme A.Ş.
Tatlısu Mah. Akif İnan Sokak No:1 ÜMRANIYE / İSTANBUL

Giriş Nozul Ekseninin Çıkış Nozul Conta Yüzeyine Uzaklığı <i>Distance of Inlet Nozzle Axis to Outlet Nozzle Gasket Surface</i>	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm
Giriş Nozul Konik Yüzeyinin Çıkış Nozul Eksenine Uzaklığı <i>Distance of Inlet Nozzle Conical Surface to Outlet Nozzle Axis</i>	103 mm	103 mm	103 mm	103 mm	103 mm	103 mm	103 mm	103 mm	103 mm	103 mm	103 mm	103 mm
Giriş – Çıkış Eksenleri Arası Açısı <i>Angle Between Input – Output Axis</i>	90 °	90 °	90 °	90 °	90 °	90 °	90 °	90 °	90 °	90 °	90 °	90 °

Daha fazla detaylı bilgi için Üreticinin teknik dosyasındadır. / For more detailed information is in the manufacturer's technical file.

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Madde / Clause	Gereklilik / Requirement	Açıklama / Definition	Not / Remark	Karar / Verdict
4	Classification	Pressure regulators shall be classified as Group 2 in accordance with EN 13611, 4.2.		P
4.1	Classes of control	For classification of controls, see the specific control standard.		P
4.2	Groups of control	Controls are grouped according to the bending stresses which they are required to withstand (see Table 4).		
		Group 1 controls Controls with connection sizes up to and including DN 20, for use in an appliance where they are not subjected to bending stresses imposed by installation pipe work or in an installation if used with rigid adjacent supports.		N/A
		Group 2 controls Controls for use in any situation, either internal or external to the appliance, typically without support.		P
5	Units of measurement and test conditions			
5.1	Units of measurement	Units of measurement shall be as given in EN 13611, 5.2		
		Except where otherwise stated in the particular clauses, measurements shall be carried out with the maximum uncertainties indicated below: — Absolute pressures ± 500 Pa or ± 4 %, whichever is greater; — Relative pressures ± 50 Pa or ± 2 % of the measured value, whichever is greater (e.g. gauge pressures or differential pressures); — Flow rate ± 3 % of the measured value; — Leakage rate ± 10 cm ³ /h (The apparatus shown schematically in Annex C or another device giving equivalent results is used.); — Time $\pm 0,1$ % or $\pm 0,2$ s, whichever is greater; — Temperatures ± 1 K; — Torque ± 10 %; — Force ± 10 %; — Current ± 1 %; — Voltage ± 1 %; — Electrical Power ± 2 %; — Supply frequency $\pm 0,1$ Hz. The full range of the measuring apparatus is chosen to be suitable for maximum anticipated value. The measurement uncertainties as listed above concern individual measurements. For measurements requiring a combination of individual measurements (e.g. efficiency measurements), lower uncertainties for the individual measurements can be necessary to limit the total uncertainty.		P

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Madde / Clause	Gereklilik / Requirement	Açıklama / Definition	Not / Remark	Karar / Verdict
5.2	Test conditions	Test conditions shall be in accordance with EN 13611, 5.1.		
		<p>Except where otherwise stated, the tests shall be carried out</p> <ul style="list-style-type: none"> — with air at $(20 \pm 5) ^\circ\text{C}$, — at ambient temperature $(20 \pm 5) ^\circ\text{C}$. <p>All measured values shall be corrected to standard conditions: 15 °C, 101,325 kPa (1 013,25 mbar) dry.</p> <p>Controls which can be converted to another gas type by exchanging components are additionally tested with the conversion components.</p> <p>Tests shall be carried out in the mounting position as stated in the installation and operating instructions.</p> <p>Where there are several mounting positions, tests shall be carried out in the least favourable position. Where possible those tests already covered by other standards (e.g. by relevant parts of prEN 60730-1:2013) shall be combined.</p> <p>All measurements shall be made after stable conditions have been reached.</p>		P
6	Construction requirements			
6.1	General			
		General construction requirements shall be in accordance with EN 13611, 6.1 with the following additional requirements.		P
		Controls shall be designed, so that the various functions operate correctly when installed and used as stated in the installation and operating instructions.		P
		Mechanical controls shall be designed such that access to internal parts requires the use of tools. For other controls access to internal parts shall only be possible by the use of tools. All pressurized parts of a control shall withstand the mechanical and thermal stresses to which it is subjected without any deformation affecting safety.		P
		Safety accessories and pressure accessories with a product of the maximum allowable pressure PS and the volume V of less than 600 000 kPa × dm ³ (6 000 bar × l) or with a product of PS and DN of less than 300 000 kPa (3 000 bar) shall conform to the requirements in Annex F, Annex G and Annex H.		P
		If a control system consists of one apparatus and provides two or more different control functions, the system shall provide the same overall safety level as the independent control functions provide for the complete application.		N/A
		Any interference between individual control functions shall be assessed with respect to both the functional condition and any fault conditions.		P
		Failures in any function shall not affect safe operation of the control function. Each individual function shall be assessed in accordance with the requirements of this standard.		P
		Control functions, integrated into a multifunctional system, shall be able to withstand the same long-term performance requirements as required for independent controls.		N/A
		Compliance to these requirements is covered by the tests given in Clause 6, Clause 7, Clause 8 and Clause 9		P
		External and internal leak tightness shall meet the requirements of 7.3. If in the event of a failure (e.g. of a diaphragm) leakage is possible, a tapping connection of at least DN 10 for an exhaust line shall be provided.		P

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Madde / Clause	Gereklilik / Requirement	Açıklama / Definition	Not / Remark	Karar / Verdict
		If a safety shut-off device for over-pressure is provided, it shall be functionally independent from the pressure regulator.		P
		Further, when the integral shut-off safety device utilizes pipeline gas as a source of energy for its operation this shall be taken from upstream of the pressure regulator.		P
		When the integral shut-off safety device is a slam-shut device or a cut-off device or a monitor, the motorization energy for a pilot controlled regulator shall be provided by the gas pressure downstream from the safety device.		P
6.2	Construction			
6.2.1	General			
		With the exception of breather holes (6.2.2), construction shall be in accordance with EN 13611, 6.2, with the additional requirements given in 6.2.3, 6.2.4 and 6.2.5 of this European Standard.		P
6.2.2	Breather Holes			
6.2.2.1	Breather holes without a connection for a vent pipe			
		Breather holes without a connection for a vent pipe shall conform to EN 13611, 6.2.3.		P
6.2.2.2	Breather holes with a connection for a vent pipe			
		If the vented capacity is greater than 70 dm ³ /h of air, a connection for a vent pipe shall be provided. Any breather/exhaust line or device fitted shall be designed to prevent the ingress of foreign materials which could damage internal parts.		N/A
		If a leakage rate limiter is used, it shall be able to withstand three times the maximum inlet pressure. If a safety diaphragm is used as a leakage rate limiter, it shall not take the place of the working diaphragm in case of a fault.		N/A
		Breather holes shall be protected against blockage or shall be located so that they do not easily become blocked. They shall be so arranged that the diaphragm cannot be damaged by a sharp device inserted through the breather hole.		N/A
6.2.3	External visual indication of the position of the closure member			
		A SSD may be fitted with an external visual device to indicate the closure member position. Where an external visual device is fitted, it shall clearly indicate whether it is in the open or closed position.		N/A
6.2.3.2	Test for leakage of breather holes			
		Rupture the dynamic part of the working diaphragm. Ensure all closure members of the control, if any, are in the open position. Pressurize all gas-carrying compartments to the maximum inlet pressure and measure the leakage rate.		P
6.2.4	Parts transmitting actuating forces			
		Parts transmitting actuating forces shall be metallic and designed with a safety factor of ≥ 3 against permanent deformation.		N/A
6.2.5	Pressure adjustment			
		The outlet pressure adjustment shall be readily accessible to authorised persons, but there shall be provision for sealing after adjustment. Means shall be provided to discourage interference by unauthorized persons.		P
6.3	Materials			
6.3.1	General			
		Materials shall conform to EN 13611, 6.3.1, 6.3.3, 6.3.4, 6.3.6, 6.3.7 and 6.3.8, with the additional requirements given in 6.3.2 and 6.3.3 of this European Standard.		P

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Madde / Clause	Gereklilik / Requirement	Açıklama / Definition	Not / Remark	Karar / Verdict
6.3.2	Springs			
6.3.2.1	General			
		Springs shall conform to EN 13611, 6.3.5, with the additional requirements given in 6.3.2.2 of this European Standard.	See technical file	P
6.3.2.2	Stresses and buckling			
		Springs shall not be overstressed under any operating conditions and there shall be sufficient free movement to allow satisfactory operation.	See technical file	P
		Springs shall be designed such that buckling does not occur, in accordance with EN 13906, parts 1 to 3.	See technical file	P
6.3.3	Requirements for elastomers (including vulcanized rubbers)			
		Elastomers shall conform to EN 682 or EN 13787 or EN 549.	See technical file	P
6.4	Gas connections			
6.4.1	General			
		Gas connections shall conform to EN 13611, 6.4.1, 6.4.4, 6.4.5, 6.4.6 and 6.4.8, with the modifications and additional requirements given in 6.4.2, 6.4.3 and 6.4.4 of this European Standard.	See technical file	P
6.4.2	Connection sizes			
		Equivalent connection sizes are given in Table 1.		P
7	Performance requirements			
7.1	General			
		Pressure regulators and safety shut-off devices shall conform to EN 13611, 7.1.		P
7.2	Strength of housings			
7.2.1	Requirement			
		The safety factor, f shall be equal to 4 for the test pressure where f is the multiplication factor for the maximum inlet pressure.		P
		When tested in accordance with 7.2.2 followed by 7.3, the external leakage shall not be higher than the values in Table 2 of EN 13611:2007.		P

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7.2.2	Performance test		
	A pressure of f times the maximum inlet pressure is applied to the control at maximum ambient temperature for a minimum of 5 min. Then the control is cooled to (20 ± 5) °C.		P
7.3	External and internal leak tightness		
	When tested in accordance with EN 13611, 7.3 with the following additions, the pressure containing parts and all connecting joints shall conform to EN 13611:2007, 7.2.		P
	The internal leakage test of the assembled SSD and its fixtures shall be carried out at ambient temperature with two different test pressures, 0,1 bar and 1,1 PS, upstream of the closure member and at atmospheric pressure downstream of the closure member.		P
	SSDs shall be tested with the pressure regulator in the open position.		P
7.4	Torsion and bending		
	When tested in accordance with EN 13611, 7.5, the torsion and bending moment shall conform to EN 13611, 7.4.		P
7.5	Control classification		
7.5.1	General		
	If more than one function exists (e.g. pressure regulator and integral safety shut-off device) then the performance of each function shall be considered separately.		P
7.5.2	Control classifications for pressure regulators		
7.5.2.1	Regulator accuracy		
	When tested in accordance with C.3.4, pressure regulators shall conform to accuracy requirements relevant to the declared accuracy class(es) chosen from Table 2 within the declared class.		P
7.5.2.2	Lock-up pressure class		
	When a pressure regulator is claimed by the manufacturer to have the ability to lock-up, the outlet pressure shall not rise by more than stated in Table 3. Such a pressure regulator shall be tested in accordance with the test method described in C.3.3.		P
7.5.3	Safety shut-off device accuracy group for over-pressure		
	When a pressure regulator is claimed by the manufacturer to have the ability to lock-up, the trip pressure deviation shall be as stated in Table 4. Such a pressure regulator shall be tested in accordance with the test method described in C.4.		P
	When tested in accordance with C.4.4, the mean set value calculated from the six actual values shall correspond to the specified accuracy group.		P

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Madde / Clause	Gereklilik / Requirement	Açıklama / Definition	Not / Remark	Karar / Verdict
7.6	Safety devices			
7.6.1	Over-pressure safety shut-off device			
	When tested in accordance with C.4, the over-pressure SSD shall close when the pressure reaches the pre-set trip pressure.			P
	The shutting-off of the gas flow shall be automatic and shall not be interruptable until the closure member has reached the closed position. Re-set shall only be possible by manual means.			P
7.6.2	Under-pressure safety shut-off devices			
	When tested in accordance with C.4, the under-pressure SSD shall close when the pressure reaches the pre-set trip pressure.			P
7.6.3	Bypass			
	If an internal bypass is fitted for the purpose of pressure equalization, it shall close safely and automatically before or during tripping.			N/A
7.6.4	Response time			
	When tested in accordance with C.4.5, the response time t shall be < 2 s;			P
7.7	Durability of performance			
7.7.1	Pressure regulator			
	The leak tightness and performance shall remain within the limits specified in 7.3 and 7.5.2 respectively without further adjustment of the setting point of the pressure regulator after testing in accordance with C.5.			P
7.7.2	Safety slam-shut device			
	The internal sealing, pressure accuracy and response time shall remain within the limits specified in 7.3, 7.6.1 and 7.6.4 respectively without further adjustment of the trip pressure after testing in accordance with C.5.			P
8	Marking, installation and operating instructions			
8.1	Marking			
	The following information, at least, shall be durably marked on the pressure regulator in a clearly visible position:			
	a) manufacturer and/or trade mark; b) type reference; c) regulator accuracy class; d) date of manufacture (at least the year). This may be in code; e) direction of gas flow by an arrow (e.g. cast or embossed); f) maximum inlet pressure; g) vent connection (if applicable).			P

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Madde / Clause	Gereklilik / Requirement	Açıklama / Definition	Not / Remark	Karar / Verdict
8.2	Installation, operating and servicing instructions			
	One set of instructions shall be supplied with each consignment, written in the language(s) of the country into which the controls are to be delivered.			P
	The instructions shall include all relevant information on the use, installation, operation and servicing of pressure regulators and any associated safety devices, in particular the following:			
	a) maximum inlet pressure; b) gas families for which the pressure regulator is suitable; c) representative performance curves/data; d) set point range; e) ambient temperature range in oC; f) mounting position(s); g) instructions for changing from one gas family to another; h) accuracy class, AC, accuracy group, AG (if applicable), lock-up group, SG (if applicable); i) lock-up pressure (if applicable); j) maintenance instructions (if applicable); k) Instructions for changing components that may be replaced to cover the whole set point range, i.e. orifices or springs; l) In particular, instructions for the installation and operation of any integrated safety devices; m) If fitted with a vent connection, the installation and operation instructions shall state that the breather shall be vented to a safe place.			P
8.3	Warning notice			
	A warning notice shall be attached to each consignment of controls. This notice should state:			
	"Read the instructions before use. This control must be installed in accordance with the rules in force".			P

* Değerlendirme kısmı P: Geçti / Pass, F: Kaldı / Fail, N/A: Uygulanmaz / Not Applicable
Evaluation Part

Mühür / Stamp

Tarih / Date
24.11.2021

Teknik Uzman / Technical Expert
Cihan DEVA

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Tatlısu Mah. Akif İnan Sokak No:1 ÜMRANIYE / İSTANBUL

TESTLER / TESTS

1. Dış Kaçak (TS EN 88-2:2007 Madde 7.3)
External Leakage (TS EN 88-2:2007 Clause 7.3)

Numune Modeli Specimen Model	Test Basıncı Test Pressure		Test Süresi Test Duration		Limit Değer Limit Value		Ortam Sıcaklığı Ambient Temp.		Sonuç / Result
GTR/GSR-MX20	8,25	Bar	10	dk / min.	40	cm ³ /h	22,3	°C	Pass
GTR/GSR-M20	8,25	Bar	10	dk / min.	40	cm ³ /h	22,1	°C	Pass
GTR/GSR-B60	8,25	Bar	10	dk / min.	40	cm ³ /h	22,2	°C	Pass
GTR/GSR-B6	8,25	Bar	10	dk / min.	40	cm ³ /h	21,3	°C	Pass
GTR/GSR-B10	8,25	Bar	10	dk / min.	40	cm ³ /h	21,1	°C	Pass
GTR/GSR-B25	8,25	Bar	10	dk / min.	40	cm ³ /h	21,6	°C	Pass

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2. İç Kaçak (TS EN 88-2:2007 Madde 7.3)
Internal Leakage (TS EN 88-2:2007 Clause 7.3)

Numune Modeli Specimen Model	Test Basıncı Test Pressure		Test Süresi Test Duration		Limit Değer Limit Value		Ortam Sıcaklığı Ambient Temp		Sonuç / Result
GTR/GSR-MX20	6 / 8,25	mbar / Bar	10	dk	40	cm ³ /h	21,3	°C	Pass
GTR/GSR-M20	6 / 8,25	mbar / Bar	10	dk	40	cm ³ /h	21,0	°C	Pass
GTR/GSR-B60	6 / 8,25	mbar / Bar	10	dk	40	cm ³ /h	21,1	°C	Pass
GTR/GSR-B6	6 / 8,25	mbar / Bar	10	dk	40	cm ³ /h	20,2	°C	Pass
GTR/GSR-B10	6 / 8,25	mbar / Bar	10	dk	40	cm ³ /h	20,5	°C	Pass
GTR/GSR-B25	6 / 8,25	mbar / Bar	10	dk	40	cm ³ /h	20,1	°C	Pass

3. Eğilme & Burulma (TS EN 88-2:2007 Madde 7.4)
Torsion and Bending (TS EN 88-2:2007 Clause 7.4)
Eğilme Deneyi / Bending

Numune Modeli Specimen Model	Uygulanan Eğilme Momenti Applied Bending Moment	Test Süresi Test Duration	Sonuç / Result
GTR/GSR-MX20	225 Nm	10 sn. / sec.	Pass
GTR/GSR-M20	225 Nm	10 sn. / sec.	Pass
GTR/GSR-B60	225 Nm	10 sn. / sec.	Pass
GTR/GSR-B6	225 Nm	10 sn. / sec.	Pass
GTR/GSR-B10	225 Nm	10 sn. / sec.	Pass
GTR/GSR-B25	225 Nm	10 sn. / sec.	Pass

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Burulma Deneyi / Torsion

Numune Modeli Specimen Model	Uygulanan Burulma Momenti Applied Torsion Moment	Sonuç / Result
GTR/GSR-MX20	85 Nm	Pass
Numune Modeli Specimen Model	Uygulanan Burulma Momenti Applied Torsion Moment	Sonuç / Result
GTR/GSR-M20	85 Nm	Pass
Numune Modeli Specimen Model	Uygulanan Burulma Momenti Applied Torsion Moment	Sonuç / Result
GTR/GSR-B60	85 Nm	Pass
Numune Modeli Specimen Model	Uygulanan Burulma Momenti Applied Torsion Moment	Sonuç / Result
GTR/GSR-B6	85 Nm	Pass
Numune Modeli Specimen Model	Uygulanan Burulma Momenti Applied Torsion Moment	Sonuç / Result
GTR/GSR-B10	85 Nm	Pass
Numune Modeli Specimen Model	Uygulanan Burulma Momenti Applied Torsion Moment	Sonuç / Result
GTR/GSR-B25	85 Nm	Pass

4. Havalandırma Deliği Sızıntı Ölçümü Deneyi (TS EN 88-2:2007 Madde 6.2.2)
Test for Leakage of Breather Holes (TS EN 88-2:2007 Clause 6.2.2)

Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-MX20	5 bar	< 70 dm ³ /h	70 dm ³ /h	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-M20	5 bar	< 70 dm ³ /h	70 dm ³ /h	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-B60	5 bar	< 70 dm ³ /h	70 dm ³ /h	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-B6	5 bar	< 70 dm ³ /h	70 dm ³ /h	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-B10	5 bar	< 70 dm ³ /h	70 dm ³ /h	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-B25	5 bar	< 70 dm ³ /h	70 dm ³ /h	Pass

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5. Metalik Olmayan Parçaların Çıkarılması Sonrasında Gövdenin Sızıntı Deneyi (TS EN 88-2:2007 Madde 6.3 & 6.3.1)
Leakage Test of Body After Removal of Non-Metallic Parts (TS EN 88-2:2007 Clause 6.3 & 6.3.1)

Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-MX20	5 bar	< 30 dm ³ /h	30 dm ³ /h	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-M20	5 bar	< 30 dm ³ /h	30 dm ³ /h	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-B60	5 bar	< 30 dm ³ /h	30 dm ³ /h	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-B6	5 bar	< 30 dm ³ /h	30 dm ³ /h	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-B10	5 bar	< 30 dm ³ /h	30 dm ³ /h	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Değer Measured Value	Limit Değer Limit Value	Sonuç / Result
GTR/GSR-B25	5 bar	< 30 dm ³ /h	30 dm ³ /h	Pass

6. Mahfaza Dayanımı Deneyi (TS EN 88-2:2007 Madde 7.2)
Strength of Housings (TS EN 88-2:2007 Clause 7.2)

Numune Modeli Specimen Model	Test Basıncı Test Pressure	Test Süresi Test Duration	Emniyet Faktörü Safety Factor	1. Ortam Sıcaklığı 1. Ambient Temp.	2. Ortam Sıcaklığı 2. Ambient Temp.	Mahfaza Durumu Housing Situation	Sonuç / Result
GTR/GSR-MX20	16 bar	5 dk. / min.	4	60 °C	22 °C	Deformasyon Yok No Deformation	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Test Süresi Test Duration	Emniyet Faktörü Safety Factor	1. Ortam Sıcaklığı 1. Ambient Temp.	2. Ortam Sıcaklığı 2. Ambient Temp.	Mahfaza Durumu Housing Situation	Sonuç / Result
GTR/GSR-M20	16 bar	5 dk. / min.	4	60 °C	22 °C	Deformasyon Yok No Deformation	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Test Süresi Test Duration	Emniyet Faktörü Safety Factor	1. Ortam Sıcaklığı 1. Ambient Temp.	2. Ortam Sıcaklığı 2. Ambient Temp.	Mahfaza Durumu Housing Situation	Sonuç / Result
GTR/GSR-B60	16 bar	5 dk. / min.	4	60 °C	22 °C	Deformasyon Yok No Deformation	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Test Süresi Test Duration	Emniyet Faktörü Safety Factor	1. Ortam Sıcaklığı 1. Ambient Temp.	2. Ortam Sıcaklığı 2. Ambient Temp.	Mahfaza Durumu Housing Situation	Sonuç / Result
GTR/GSR-B6	16 bar	5 dk. / min.	4	60 °C	22 °C	Deformasyon Yok No Deformation	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Test Süresi Test Duration	Emniyet Faktörü Safety Factor	1. Ortam Sıcaklığı 1. Ambient Temp.	2. Ortam Sıcaklığı 2. Ambient Temp.	Mahfaza Durumu Housing Situation	Sonuç / Result
GTR/GSR-B10	16 bar	5 dk. / min.	4	60 °C	22 °C	Deformasyon Yok No Deformation	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Test Süresi Test Duration	Emniyet Faktörü Safety Factor	1. Ortam Sıcaklığı 1. Ambient Temp.	2. Ortam Sıcaklığı 2. Ambient Temp.	Mahfaza Durumu Housing Situation	Sonuç / Result
GTR/GSR-B25	16 bar	5 dk. / min.	4	60 °C	22 °C	Deformasyon Yok No Deformation	Pass

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6.1. Mahfaza Deneyi Sonrası Dış Kaçak Deneyi
External Leakage Test After Housing Test

Numune Modeli Specimen Model	Test Basıncı Test Pressure		Test Süresi Test Duration		Limit Değer Limit Value		Ortam Sıcaklığı Ambient Temp.		Sonuç / Result
GTR/GSR-MX20	7,5	Bar	10	dk. / min.	40	cm ³ /h	22,3	°C	Pass
GTR/GSR-M20	7,5	Bar	10	dk. / min.	40	cm ³ /h	22,1	°C	Pass
GTR/GSR-B60	7,5	Bar	10	dk. / min.	40	cm ³ /h	22,2	°C	Pass
GTR/GSR-B6	7,5	Bar	10	dk. / min.	40	cm ³ /h	21,6	°C	Pass
GTR/GSR-B10	7,5	Bar	10	dk. / min.	40	cm ³ /h	21,1	°C	Pass
GTR/GSR-B25	7,5	Bar	10	dk. / min.	40	cm ³ /h	21,7	°C	Pass

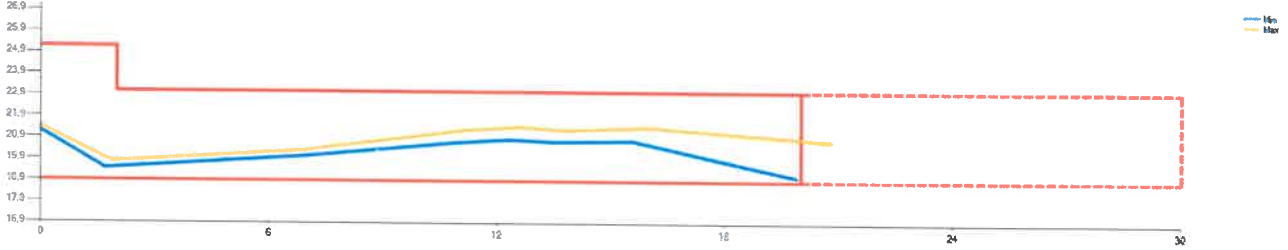
7. Performans Eğrilerinin Belirlenmesi (TS EN 88-2:2007 Madde 7)
Determination of a Performance Curve (TS EN 88-2:2007 Clause 7)

GTR/GSR-MX20					GTR/GSR-M20					GTR/GSR-B60				
Giriş basıncı (bar) / Inlet Pressure														
0,5			5		0,5			5		0,5			5	
Çıkış Basıncı (mbar) / Outlet Pressure														
Artan Increase	Azalan Decrease	Artan Increase	Azalan Decrease	Debi (m ³ /h) Flow Rate	Artan Increase	Azalan Decrease	Artan Increase	Azalan Decrease	Debi (m ³ /h) Flow Rate	Artan Increase	Azalan Decrease	Artan Increase	Azalan Decrease	Debi (m ³ /h) Flow Rate
21,0	21,4	21,2	21,6	0,0	24,1	24,7	23,5	24,0	0,0	307,1	307,4	305,1	306,5	0,0
19,3	19,6	19,5	20,1	1,7	21,1	21,7	20,5	21,0	1,8	300,7	300,8	300,0	300,6	6,3
19,5	20,6	19,8	20,9	7,0	20,2	20,7	19,7	20,0	7,1	295,0	294,5	294,8	294,7	16,4
19,6	21,8	20,6	22,0	10,9	20,3	21,3	20,5	21,2	11,0	286,3	286,2	286,6	286,6	33,2
19,4	22,3	20,6	22,3	12,3	20,3	21,4	20,5	21,0	12,5	283,7	283,9	284,0	284,3	40,0
19,2	22,3	20,4	22,2	13,5	20,2	21,1	20,2	20,9	13,6	283,5	283,6	284,0	284,2	40,7
19,5	22,1	20,5	22,4	15,6	20,2	20,6	20,3	20,6	15,8	279,5	278,9	280,5	280,4	47,5
19,1	19,1	20,8	20,8	19,9	19,9	19,9	19,9	19,9	20,3	271,7	271,7	275,0	275,0	60,0
Histeresiz / Hysteresis														
15			9		5			3		0			0	
Tahliye Basıncı / Relief Pressure (mbar)														
35,1					36,6					410,5				

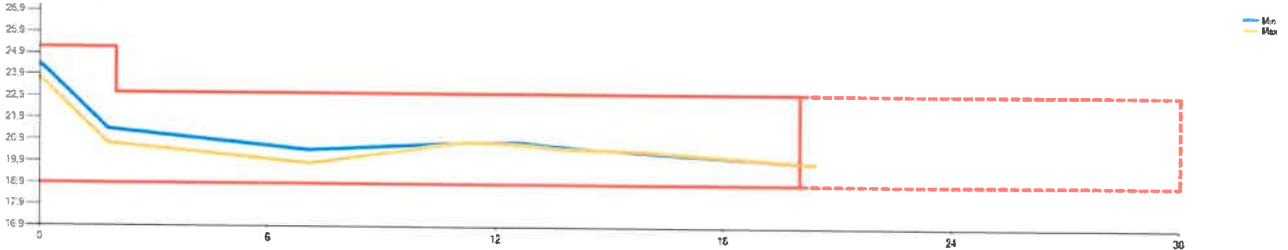
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GTR/GSR-B6					GTR/GSR-B10					GTR/GSR-B25				
Giriş basıncı (bar) / Inlet Pressure														
0,5			4		0,5			4		0,5			4	
Çıkış Basıncı (mbar) / Outlet Pressure														
Artan Increase	Azalan Decrease	Artan Increase	Azalan Decrease	Debi (m3/h) Flow Rate	Artan Increase	Azalan Decrease	Artan Increase	Azalan Decrease	Debi (m3/h) Flow Rate	Artan Increase	Azalan Decrease	Artan Increase	Azalan Decrease	Debi (m3/h) Flow Rate
22,4	22,5	22,3	22,3	0,0	23,7	24,2	23,1	24,0	0,0	22,3	23,7	22,3	23,2	0
20,5	21,3	20,8	20,9	0,8	20,8	20,9	21,0	21,1	1,0	21,0	20,9	21,4	21,5	2,5
20,6	20,6	20,7	20,9	1,7	20,8	20,8	21,0	21,0	2,5	20,8	21,2	21,3	21,4	4,8
20,5	21,2	20,8	20,8	3,3	21,0	21,0	21,2	21,2	3,6	20,7	21,3	21,2	21,2	10
21,1	21,0	20,8	20,8	5,1	21,1	21,0	21,3	21,4	4,4	20,9	21,0	21,3	21,4	15,3
20,8	20,9	20,7	20,9	5,8	21,1	21,2	21,4	21,5	6,8	21,0	21,2	21,4	21,5	20,1
20,7	21,0	20,5	20,6	6,2	20,8	21,0	20,9	21,0	10,2	21,0	21,3	21,2	21,4	25,4
20,5	20,8	20,3	20,5	7,9	20,5	20,8	20,7	20,9	12,5	20,8	20,9	20,8	20,9	37
Histeresiz / Hysteresis														
4			1		1			1		3			1	
Tahliye Basıncı / Relief Pressure (mbar)														
43					41,6					43				

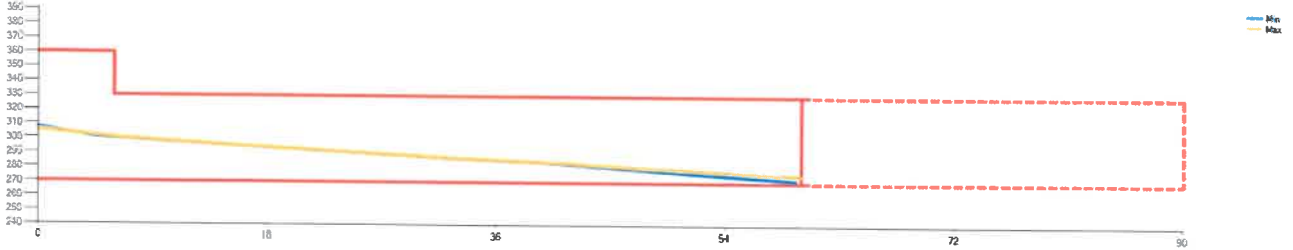
GTR/GSR-MX20



GTR/GSR-M20

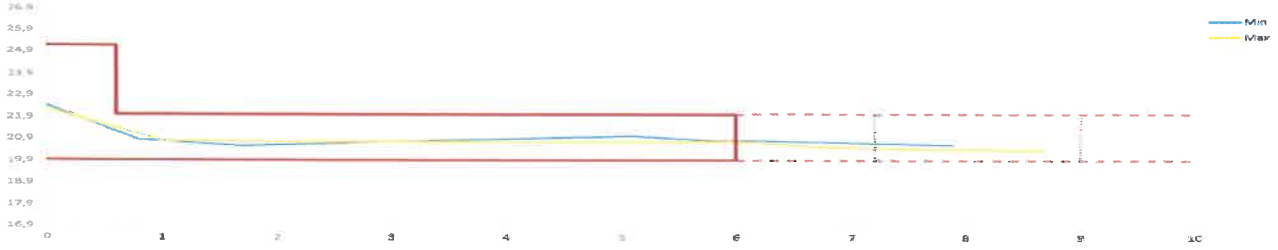


GTR/GSR-B60

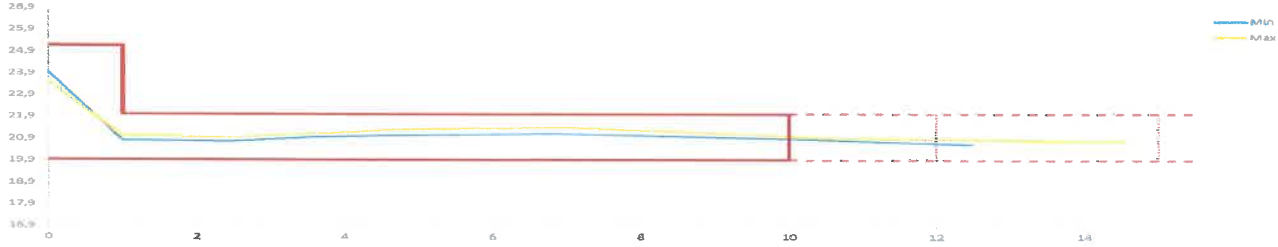


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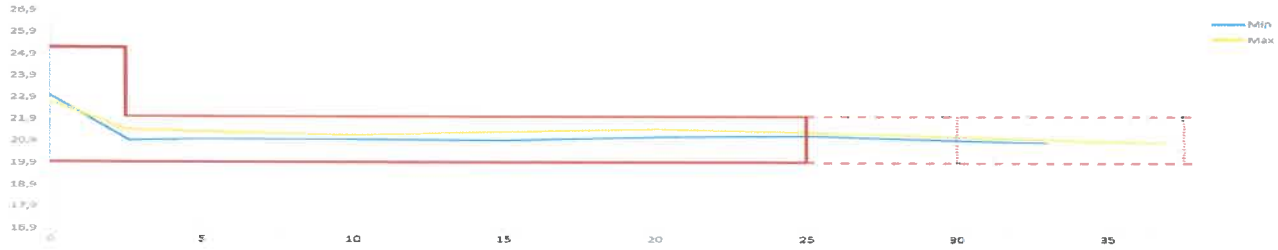
GTR/GSR-B6



GTR/GSR-B10



GTR/GSR-B25



8. Tepki Süresi (TS EN 88-2:2007 Madde 7.6.4) Response Time (TS EN 88-2:2007 Clause 7.6.4)

Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Tepki Süresi Measured Response Time	Sonuç / Result
GTR/GSR-MX20	5 bar	< 2 s	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Tepki Süresi Measured Response Time	Sonuç / Result
GTR/GSR-M20	5 bar	< 2 s	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Tepki Süresi Measured Response Time	Sonuç / Result
GTR/GSR-B60	5 bar	< 2 s	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Tepki Süresi Measured Response Time	Sonuç / Result
GTR/GSR-B6	5 bar	< 2 s	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Tepki Süresi Measured Response Time	Sonuç / Result
GTR/GSR-B10	5 bar	< 2 s	Pass
Numune Modeli Specimen Model	Test Basıncı Test Pressure	Ölçülen Tepki Süresi Measured Response Time	Sonuç / Result
GTR/GSR-B25	5 bar	< 2 s	Pass

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