

Test Report

Accredited Test
Laboratory (DATech)
Reg.No.DAT-P-087/99-11

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Report No	Number of		issued date
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MHM-EST-7.70073194	1	6	17.06.2004

Test

Vibration and shock tests

Test basis / specification

Customer specification, following DIN EN 61373

Unit under test (UUT)	Type designation	Identification no.
Sub rack	6U 84HP, 235 deep	n.e.

Client	Manufacturer
Schroff GmbH Langenalber Strasse 96 - 100 75334 Straubenhardt	see client

Test engineer	Receipt of UUT date	Test date / period of time
Bernhard Abel	24.05.2004	24./25.05.2004

edited
signature



B. Abel
Test engineer

verified
signature



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Prüfbericht

Akkreditiertes Prüflabor
(DATEch) e.V.
DAR-Reg.Nr. DAT-P-087/99-11

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Bericht Nummer	Anzahl Ausfertigung	Seiten	ausgestellt Datum
MHM-EST-7.70073194	1	6	17.06.2004

Prüfung

Schwing- und Schockprüfungen

Prüfgrundlage/-Spezifikation

Kundenanforderung in Anlehnung an DIN EN 50155 und DIN EN 61373

Prüfobjekt	Typbezeichnung	Ident-Nr.
Baugruppenträger	6U 84HP, 235 deep	europacPRO, 21500-080

Auftraggeber	Hersteller
Schroff GmbH Langenalber Strasse 96 - 100 75334 Straubenhardt	siehe Auftraggeber

Bearbeiter	Eingang Datum	Prüfdatum/-zeitraum
Bernhard Abel	24.05.2004	24./25.05.2004

erstellt
Unterschrift

B. Abel
Sachbearbeiter

freigegeben
Unterschrift

W. Jakob
Abteilungsleiter

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1 Test equipment

Equipment	Type	Ser.-No.	Manufacturer
shaker:	V875-440		Ling Dynamic Systems
vibration control system:	Vibco-NT		Mahrenholz & Partner
signal conditioner:	133	AG 90	Endevco
accelerometers:	752-10	11610 11611	Endevco

All measuring equipment is calibrated regularly according the calibration instruction of TÜV PRODUCT SERVICE GmbH. All calibrations are traced back to national standards.

2 Test procedure

2.1 Unit under test

The unit under test was a sub rack for application in railway vehicles. The individual modules were dummy boards, mounted with 4 weights each of 60 gramm (see annex /A-3/). Purpose of the testing was determination of the stability of the sub rack.

2.2 Test specification

2.2.1 vibration test, random

frequency range:	5 Hz - 150 Hz	
amplitude:	longitudinal / transversal	vertical
	5 Hz, 0,00901 g ² /Hz	5 Hz, 0,01857 g ² /Hz
	20 Hz, 0,00901 g ² /Hz	20 Hz, 0,01857 g ² /Hz
	150 Hz, 0,0001603 g ² /Hz	150 Hz, 0,0003301 g ² /Hz
	0,56 g _{eff}	0,805 g _{eff}
test duration:	5 h / axis, in 3 axes	

2.2.2 shock test

type of shock:	half sine
amplitude:	5 g
shock duration:	30 ms
number of shock:	3 Schocks each in both directions on three mutually perpendicular axes

2.3 Test sequence

No.	Test	Run	Axis	Notes
1	vibration, random	1	Z-	
2	shocks	2		3 x positive 3 x negative
3	vibration, random	3	X-	
4	shocks	4		3 x positive 3 x negative
5	vibration, random	5	Y-	
6	shocks	6		3 x positive 3 x negative

3 Test results

The unit have passed the test successfully.

The unit under test was opened by the client for visual inspection by the client himself and our test engineer. The visual inspection showed no damages. A detailed test will be carried out by the customer in his own test lab.

4 Legend of the measuring diagrams

4.1 vibration tests (see / A-1 / sheet 1)

- 1 frequency range in Hz
- 2 acceleration level in g
- 3 acceleration spectral density in g^2/Hz
- 4 test duration
- 5 acceleration "a", reference value in g (pk or rms)
- 6 acceleration "a", measured value in g (pk or rms)
- 7 velocity "v", reference value in m/s
- 8 velocity "v", measured value in m/s
- 9 displacement "d", reference value in mm
- 10 displacement "d", measured value in mm
- 11 indication of the control channel
- 12 indication of the measuring channels
- 13 vibration axis
- 14 number of run

4.2 shock tests (see / A-2 / sheet 1)

- 1 X-axis: time in ms
- 2 Y-axis: acceleration level in g
- 3 shock duration in ms
- 4 number of test shocks
- 5 reference level in g
- 6 maximum measured value in g
- 11 indication of control channel
- 12 indication of measuring channels
- 13 vibration axis
- 14 number of runs

Note: Before applying the test shocks several reference shocks of a lower level (- 12 dB) were applied as equipment test. This explains the different number of shocks in the measuring diagrams.

5 Photo documentation

Photo 1: Z-axis



Photo 2: Z-axis

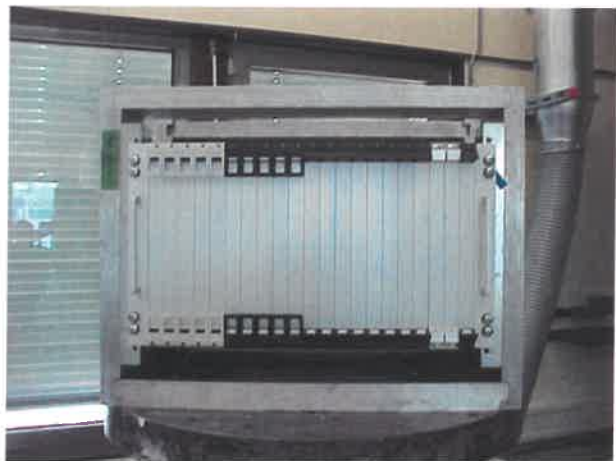


Photo 3: X-axis



Photo 4: Y-axis

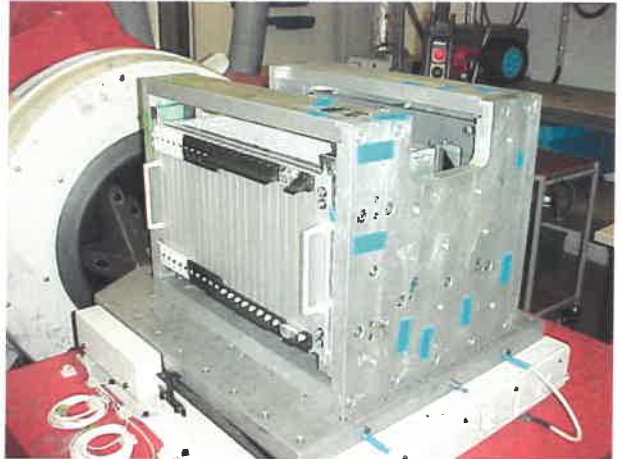
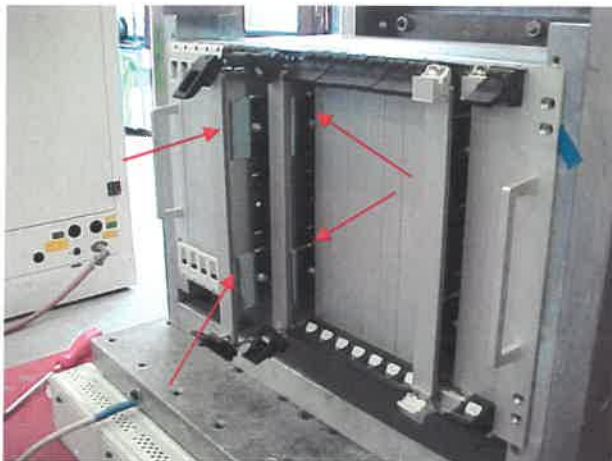


Photo 5: load-weight





Regelkanal

Rauschen
 100 mV/g
 Control Ch. 4 (14)

Product Service

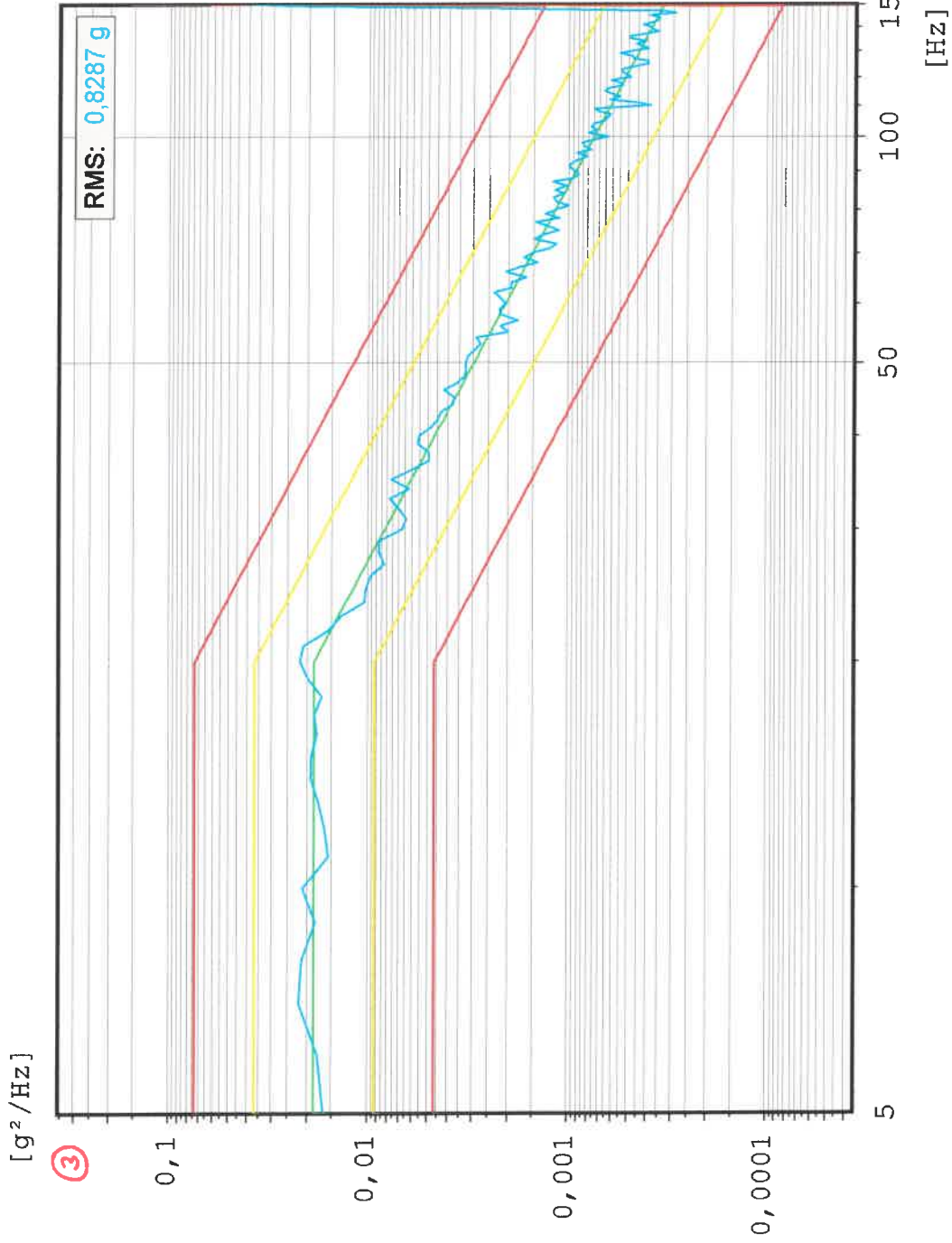
Pegelstufe : 0 dB
 Auflösung : 1 Hz
 DOF : 90
 Betriebsart: Closed Loop
 RMS (Ist): 0,8287 g (6)
 RMS (Soll): 0,807 g (5)

---- Testzeit ----
 verstrichen: 5:10:32 (4)
 verbleibend: 0:00:03

Datum: 24.05.04
 14:25:20

Schroff GmbH
 BGTR 6U 84HP, 235 deep

Run 1 (14)
 Z-Achse (13)





control channel

Rauschen
 100 mV/g
 Control Ch. 4

Product Service

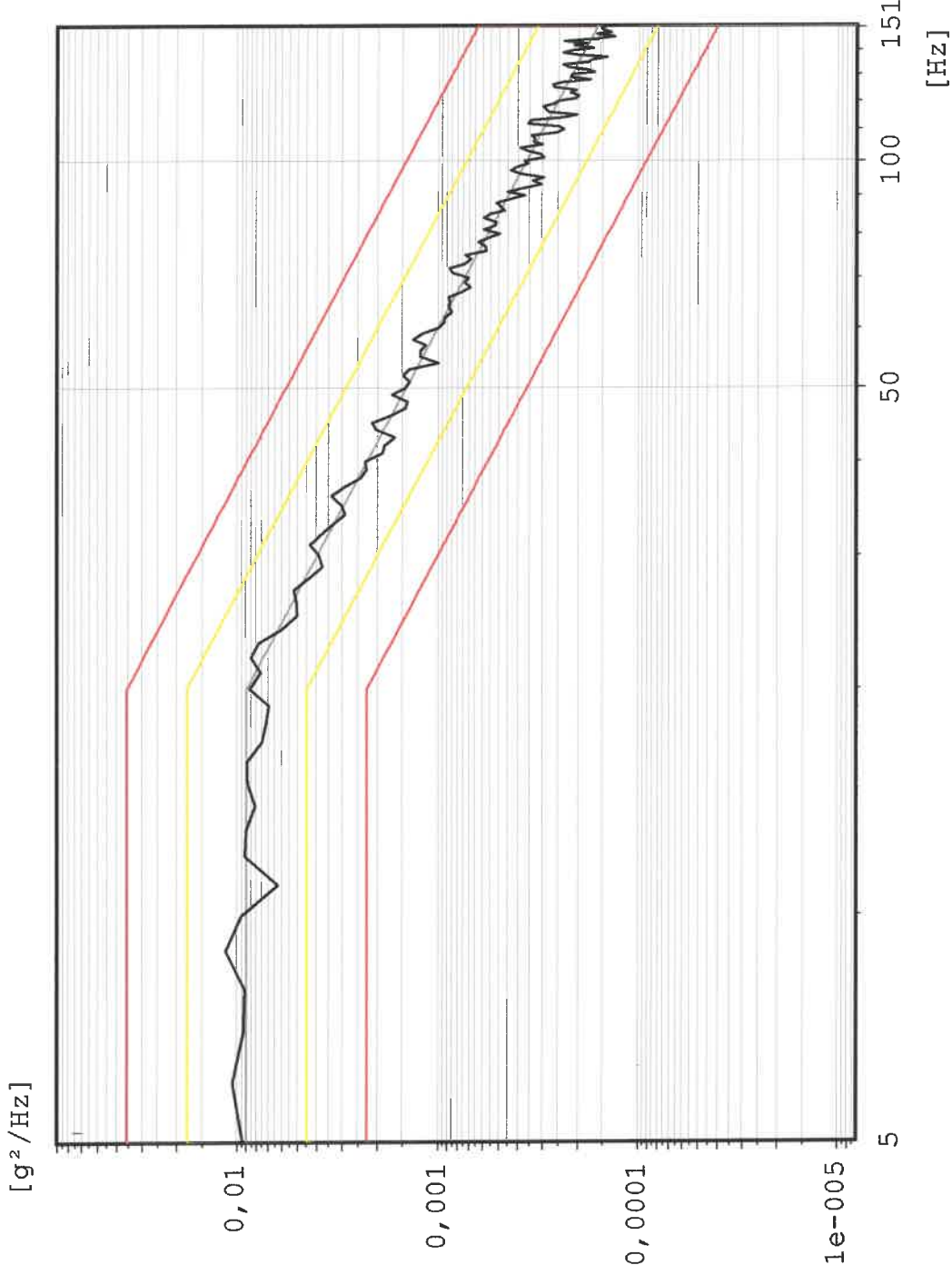
Kan.Nr: 4
 Kan.Typ: C
 DOF: 90
 Pegel: 0,0 dB
 Auflösung: 1 Hz
 Regelstrat.: Average
 Einh.: g^2/Hz
 RMS (Ist): 0,5442 g
 RMS (Soll): 0,5449 g
 Betriebsart: Closed loop

Zeit (akt. Pegel)
 Verstrichen: 005:10:00
 Verbleibend: 000:00:00

Zeit (gesamt)
 Verstrichen: 005:10:30
 Verbleibend: 000:00:00

Datum: 24.05.04
 Zeit: 21:00:07

Schroff GmbH
 BGTR 6U 84HP, 235 deep
 Run 3
 X-Achse





Product Service

Pegelstufe : 0 dB
Auflösung : 1 Hz
DOF : 90
Betriebsart: Closed Loop
RMS (Ist): 0,7999 g
RMS (Soll): 0,807 g

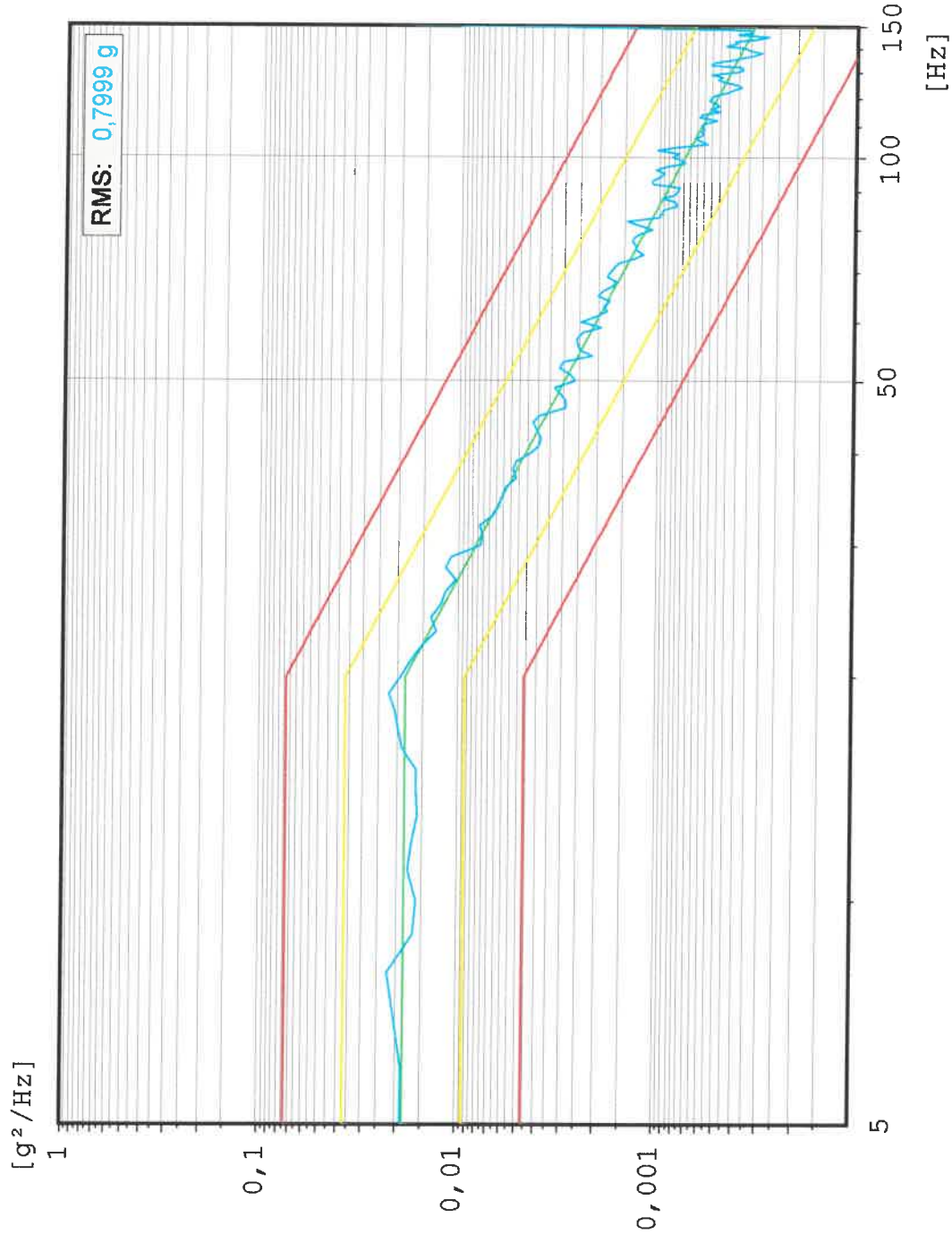
----- Testzeit -----
verstrichen: 5:11:01
verbleibend: 0:00:01

Datum: 25.05.04
12:25:47

Schroff GmbH
BGTR 6U 84HP, 235 deep
Run 5
Y-Achse

Regelkanal

Rauschen
100 mV/g
Control Ch. 4

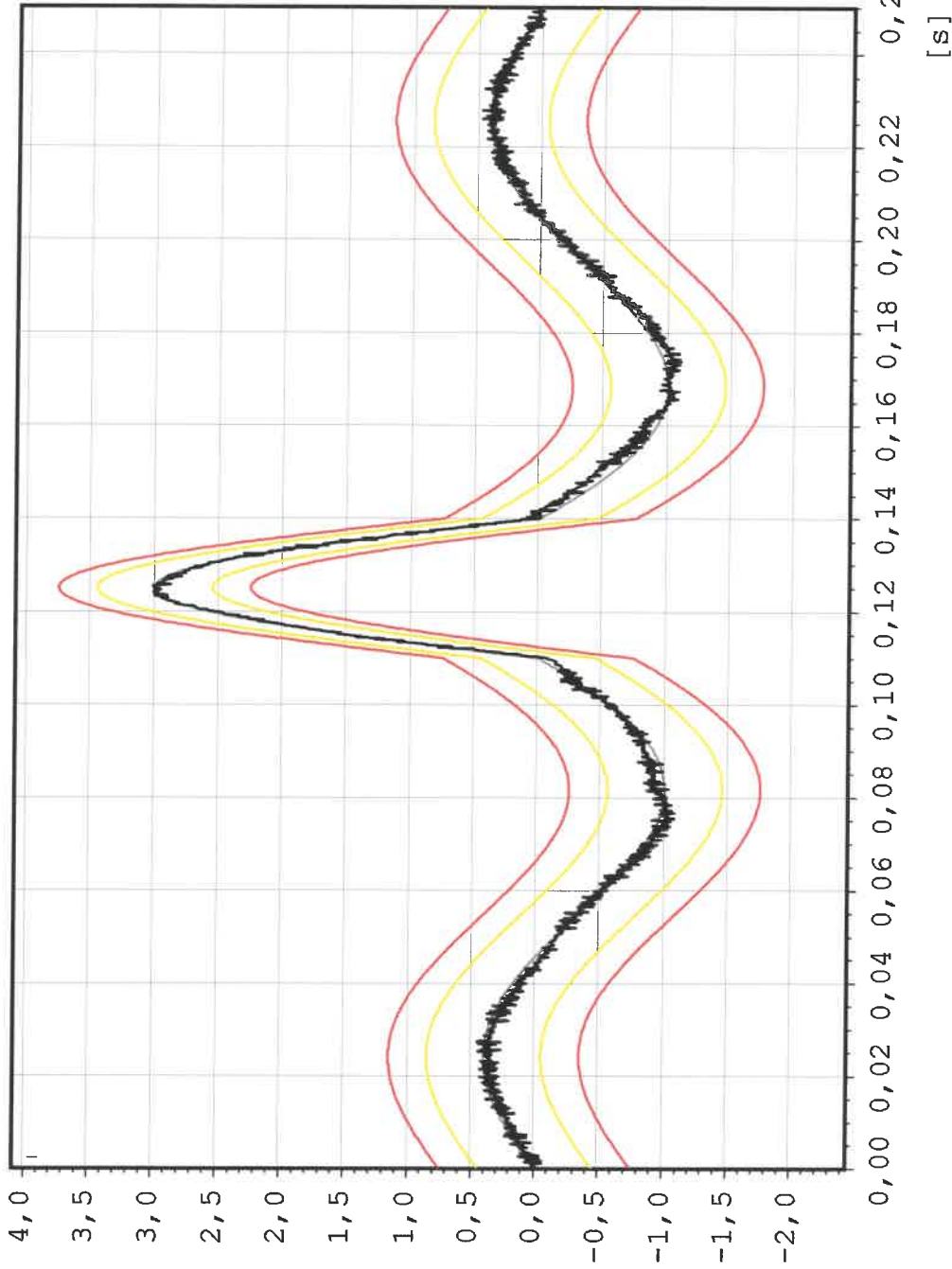




control channel

Klassischer Schock
 Control-Ch. 4 (M)
 100 mV/g

② [g]



Product Service

Kan.Nr: 4
 Kan.Typ: C
 Pegel: 0,0 dB
 Auflösung: 2,44e-004 s
 Einh.: g
 Peak (Ist): 3,021 (6)
 Peak (Soll): 3 (5)

Pulse (akt. Pegel)
 Erfolgt: 3
 Verbleibend: 3 (4)

Pulse (gesamt)
 Erfolgt: 23
 Verbleibend: 3

Datum: 24.05.04
 Zeit: 14:42:09

Schroff GmbH
 BGTR 6U 84HP, 235 deep
 Run 2 (M) (13)
 Z-Achse (13)



Product Service

Pegelstufe : 0 dB
Auflösung : 2,441e-004 s
Peak : -3,741 Peak

--- Pulse Pegelstufe ---
ausgegeben : 6
verbleibend : 0
--- Pulse total ---
ausgegeben : 26
verbleibend : 0

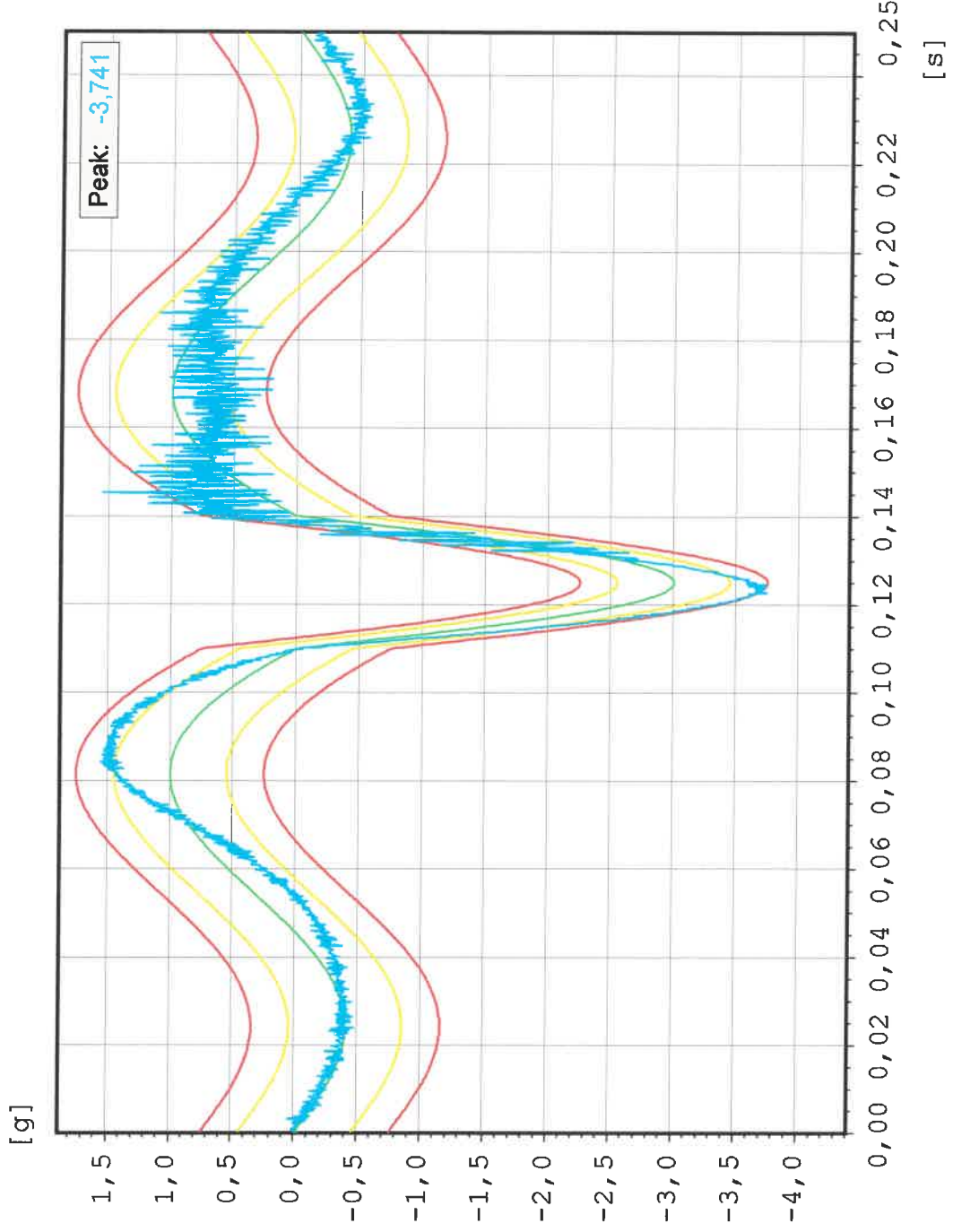
Datum: 24.05.04
14:45:16

Schroff GmbH
BGTR 6U 84HP, 235 deep

Run 2
Z-Achse

Regelkanal

Klassischer Schock
Control-Ch. 4
100 mV/g





control channel

Klassischer Schock
Control-Ch. 4
100 mV/g

Product Service

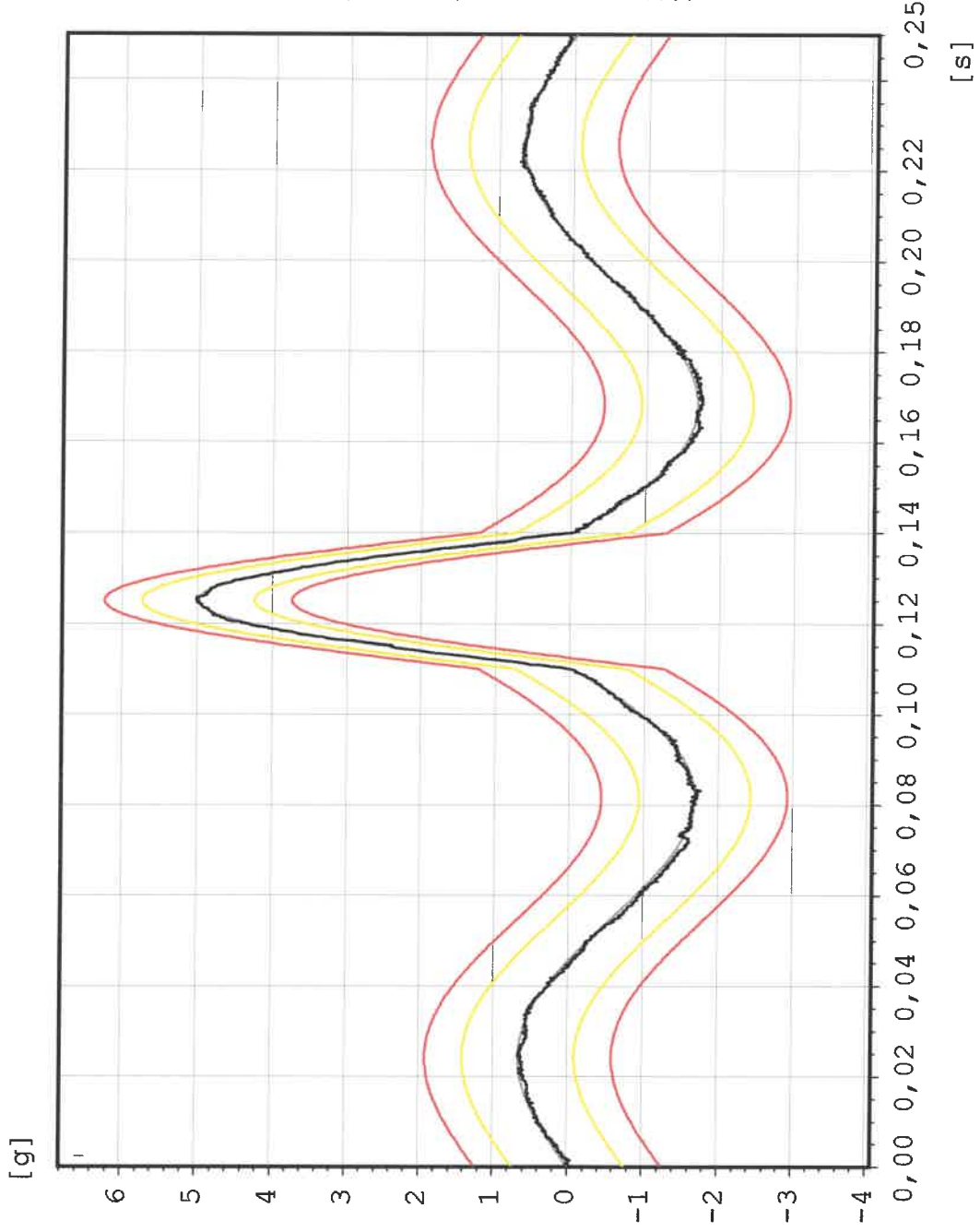
Kan.Nr.: 4
Kan.Typ: C
Pegel: 0,0 dB
Auflösung: 2,44e-004 s
Einh.: g
Peak (Ist): 5,029
Peak (Soll): 5

Pulse (akt. Pegel)
Erfolgt: 3
Verbleibend: 3

Pulse (gesamt)
Erfolgt: 23
Verbleibend: 3

Datum: 25.05.04
Zeit: 06:44:10

Schroff GmbH
BGTR 6U 84HP, 235 deep
Run 4
X-Achse





Product Service

Kan.Nr: 4
Kan.Typ: C
Pegel: 0,0 dB
Auflösung: 2,44e-004 s
Einh.: g
Peak (Ist): -5,409
Peak (Soll): -5

Pulse (akt. Pegel)
Erfolgt: 6
Verbleibend: 0

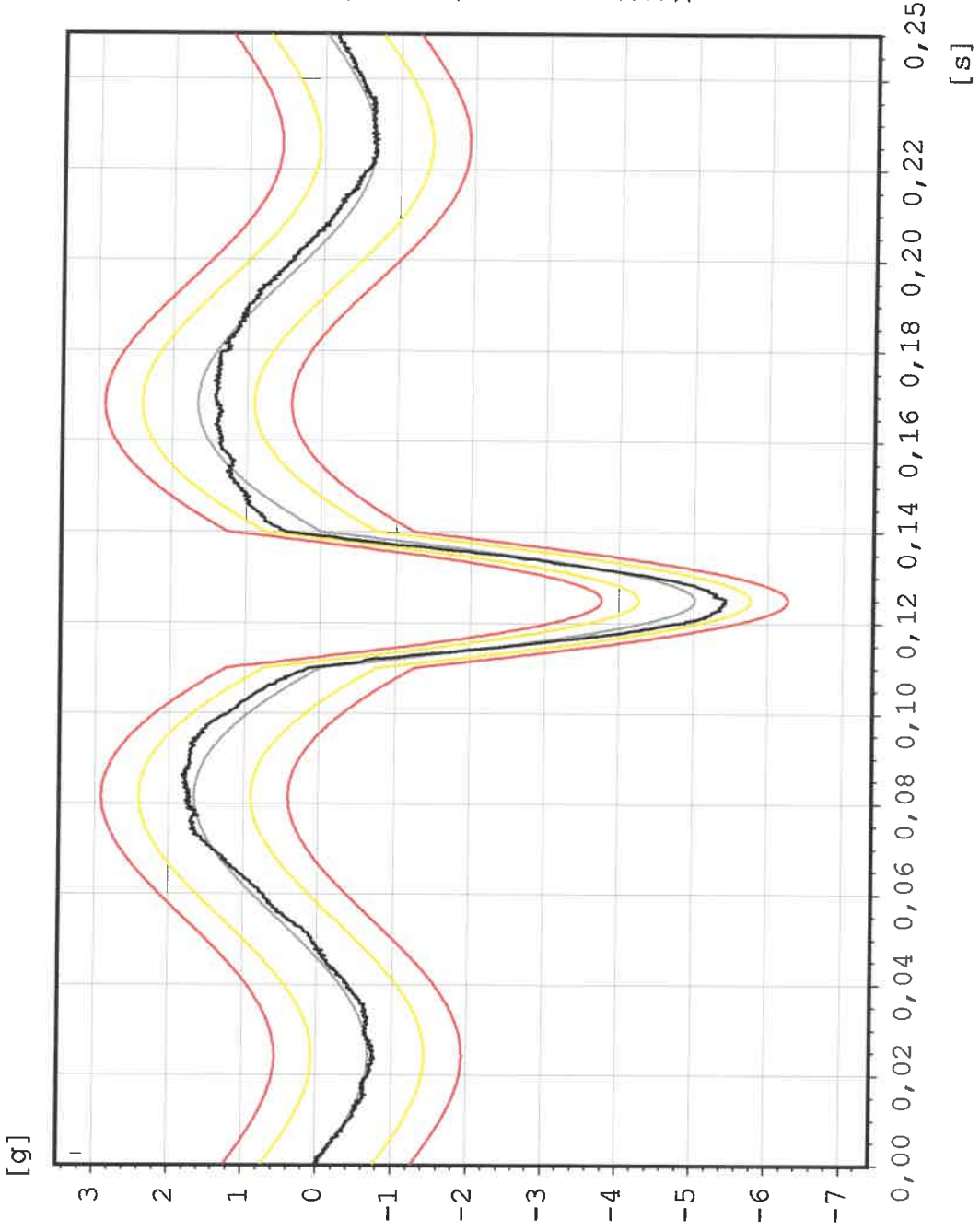
Pulse (gesamt)
Erfolgt: 26
Verbleibend: 0

Datum: 25.05.04
Zeit: 06:45:12

Schroff GmbH
BGTR 6U 84HP, 235 deep
Run 4
X-Achse

control channel

Klassischer Schock
Control-Ch. 4
100 mV/g

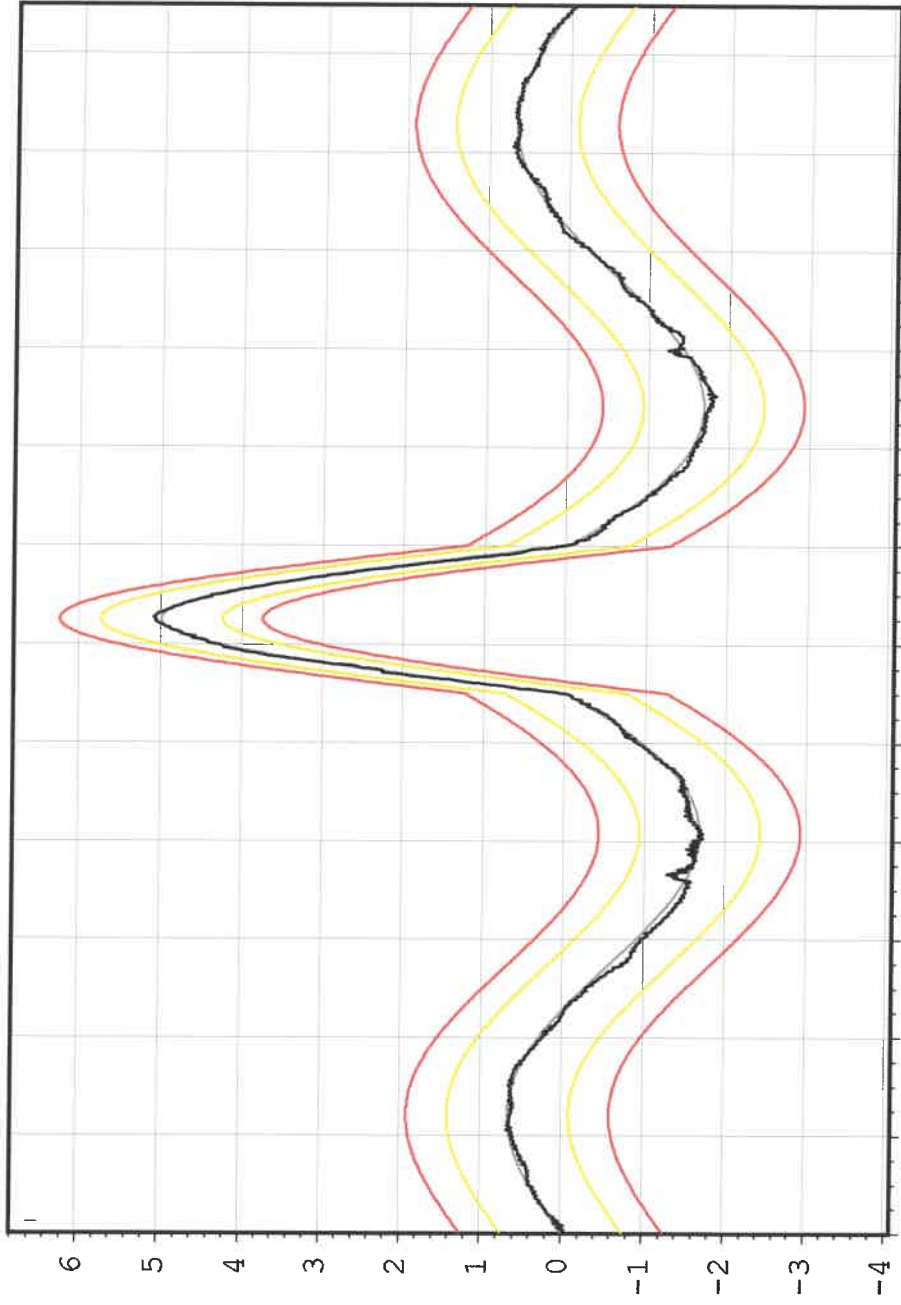




control channel

Klassischer Schock
Control-Ch. 4
100 mV/g

[g]



[s]

Product Service

Kan.Nr.: 4
Kan.Typ: C
Pegel: 0,0 dB
Auflösung: 2,44e-004 s
Einh.: g
Peak (Ist): 5,098
Peak (Soll): 5

Pulse (akt. Pegel)
Erfolgt: 3
Verbleibend: 3

Pulse (gesamt)
Erfolgt: 23
Verbleibend: 3

Datum: 25.05.04
Zeit: 12:31:45

Schroff GmbH
BGTR 6U 84HP, 235 deep
Run 6
Y-Achse



Regelkanal

Klassischer Schock
Control-Ch. 4
100 mV/g

Product Service

Pegelstufe : 0 dB
Auflösung : 2,441e-004 s
Peak : -5,351 Peak

--- Pulse Pegelstufe ---
ausgegeben : 6
verbleibend: 0
--- Pulse total ---
ausgegeben : 26
verbleibend: 0

Datum: 25.05.04
12:32:18

Schroff GmbH
BGTR 6U 84HP, 235 deep

Run 6
Y-Achse

