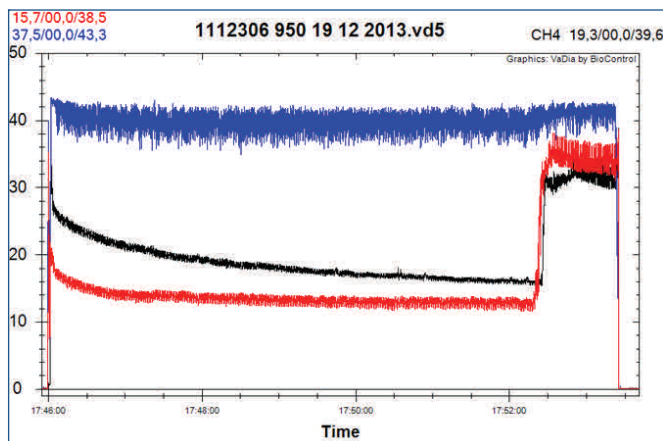
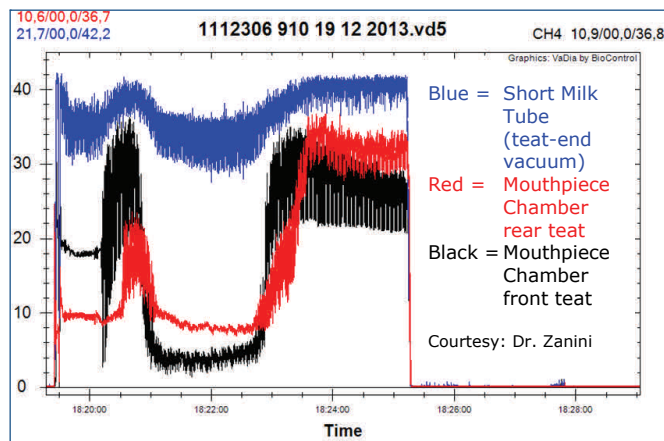


Logging and Analyzing Milking Vacuum

VaDia is developed by BioControl in close cooperation with IDF, the International Dairy Federation and Tine, the Norwegian dairy farmers cooperative. VaDia logs the vacuum during milking at 4 points in the milking cluster. It is battery operated and small and lightweight enough to be attached to a teat cup during milking. VaDia is the ideal instrument for easy Milking Time Testing and fast Pulsator Testing, designed for advisors and professionals in the dairy industry.



immediate milk release, no overmilking, but slow milking

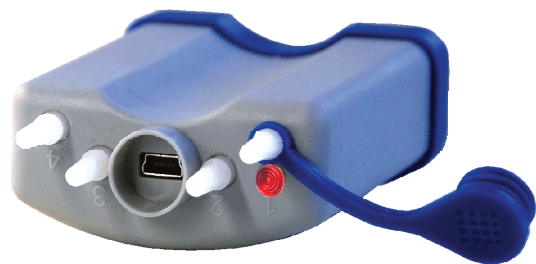


bimodal milk release, significant overmilking

The IDF project group 'Milking Time Tests and Interpretation of Results' has initiated VaDia as an instrument for Milking Time Test routines. VaDia can be used for vacuum logging during milking to better analyze milking routines and milking equipment in order to improve udder health and milk quality.



Small, lightweight, 'shell-curved'

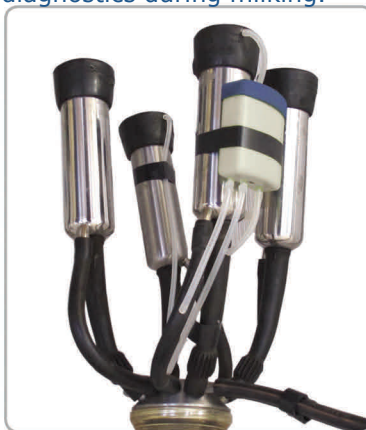


4 vacuum channels, indicator light and watertight USB

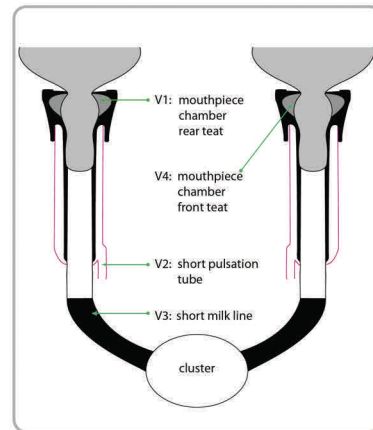


Alkaline possible if rechargeable empty

The logs are stored in the VaDia and downloaded to a PC for detailed analysis after milking. Bluetooth streaming data enables immediate, in-parlor results, which is very convenient for diagnostics during milking.



Taped to cluster during milking



4 vacuum logging points

- 4 vacuum channels, 200 samples/second/channel, 8 hours logging capacity
- Log-file retrieved through USB. Bluetooth streaming data with 200 samples/second/channel
- Rechargeable AA battery, charging from PC-USB. If battery is empty: Alkaline AA can be used for emergency
- VaDia Suite software for analyzing and report making
- Water resistant housing, HxWxD: 9x6x3 cm. 85 grams
- Up to 80 kPa, accuracy ± 0.2 kPa

Easy Milking Time Test with VaDia

Udder health problems are often related to the milking equipment, many times in combination with inadequate milking routines. Notorious are teat-end vacuum fluctuations due to poor quality liners, liner slips or insufficient vacuum capacity. Pathogens reaching the teat-end due to 'back-spray' or 'cluster flooding' is another known cause.

BioControl's VaDia is designed for milking technicians, advisers, veterinarians and other professionals in the dairy industry to deal with udder health and milk quality problems. It is the next generation Milking Time Test (MTT) instrument for testing during milking.

VaDia works completely 'stand-alone', which enables the advisor to forget about the actual measurement and concentrate on observing milking routines.

VaDia can be used on all brands and types of milking equipment, including robots.

MTT with VaDia gives insight in:

- Proper cow preparation (fast milk release)
- Overmilking
- Automatic take-off functioning
- Do these liners fit these teats?
- Vacuum level and fluctuations
- Average teat-end vacuum during peak flow



needle pierces 'straw' in liner



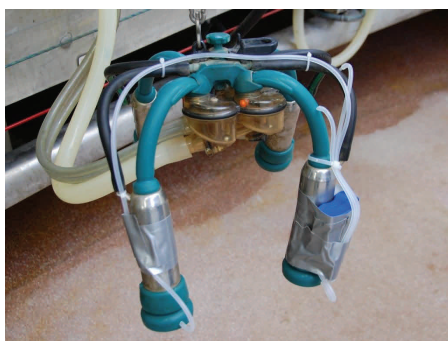
straw in Mouth Piece Chamber



piercing straw in Short Milk Tube



silicon tubes connect straws to VaDia



VaDia on cluster, ready for milking



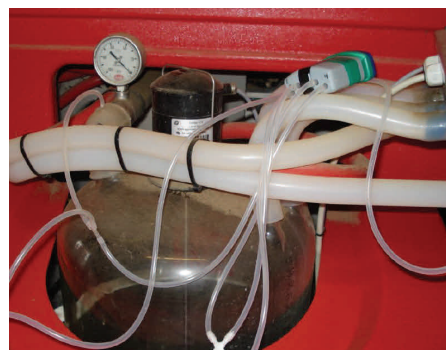
VaDia on robot



fits every milking cluster



ready for another recording



VaDia to log other vacuum sources

Fast Pulsator Testing with VaDia

Research clearly demonstrates that malfunctioning pulsators have a big impact on udder health and milk quality. Correct timing of the A, B, C and D-phases is important to ensure fast and complete milking; correct vacuum build-up in the pulsator channels is necessary to ensure proper liner opening and closing. Professional dairy farmers understand that the pulsator is a critical component that needs to be tested periodically.

The VaDia Suite PC-software is equipped with a Pulsator Test module for fast and easy pulsator 'dry-testing' according to ISO 6690 and for detailed analysis during milking in the Milking Time Test.

Pulsator Testing with VaDia can be done:

- Online (Bluetooth streaming for immediate result during the test)
- Offline (analyzing all pulsator data after the test)



DATA SUMMARY	30-5-2013	DATA SUMMARY	30-5-2013
Pulsation		Pulsation	
Rate (bpm):	59,8	Rate (bpm):	59,8
Ratio:	60,2 : 39,8	Ratio:	60,1 : 39,9
A Phase:	9,6% 96	A Phase:	9,7% 97
B Phase:	50,6% 508	B Phase:	50,4% 506
C Phase:	9,8% 98	C Phase:	9,8% 98
D Phase:	30,0% 301	D Phase:	30,1% 302
A+B Phase:	60,2% 604	A+B Phase:	60,1% 603
C+D Phase:	39,8% 399	C+D Phase:	39,9% 400
Vacuum:	43,6	Vacuum:	43,5

VaDia Suite Pulsator Test results

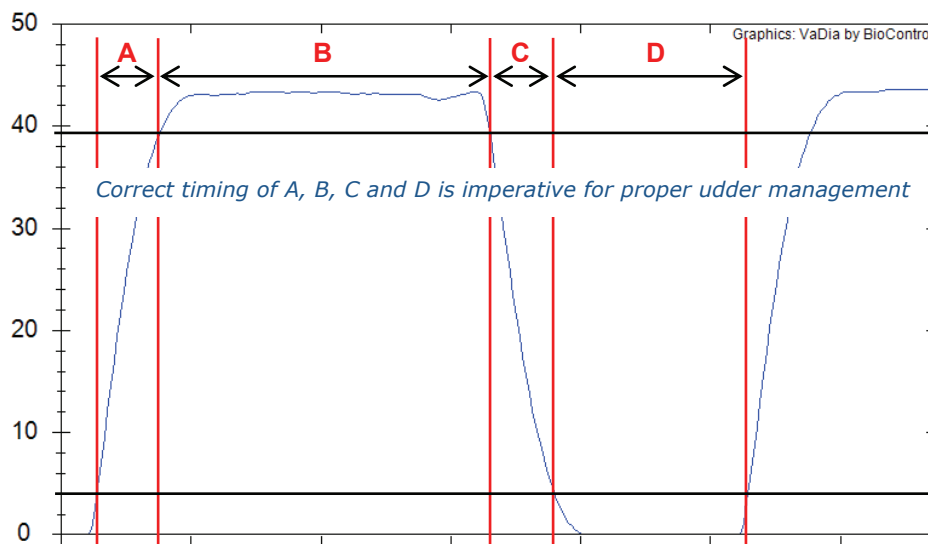
Plusator test conditions

	Target	Deviation %	Value
A (msec)	100	10,0	10
B (msec)	500	10,0	50
C (msec)	100	10,0	10
D (msec)	300	10,0	30
Rate	60	5,0	3
Vmax	42	5,0	2,1
Ratio	60	5,0	3
Limp	2		
Dip	4		

Below Min: Rear Front
Within scope: Rear Front
Above Max: Rear Front

Do not use these conditions Apply conditions

VaDia Suite Pulsator Test module highlights deviations from set targets



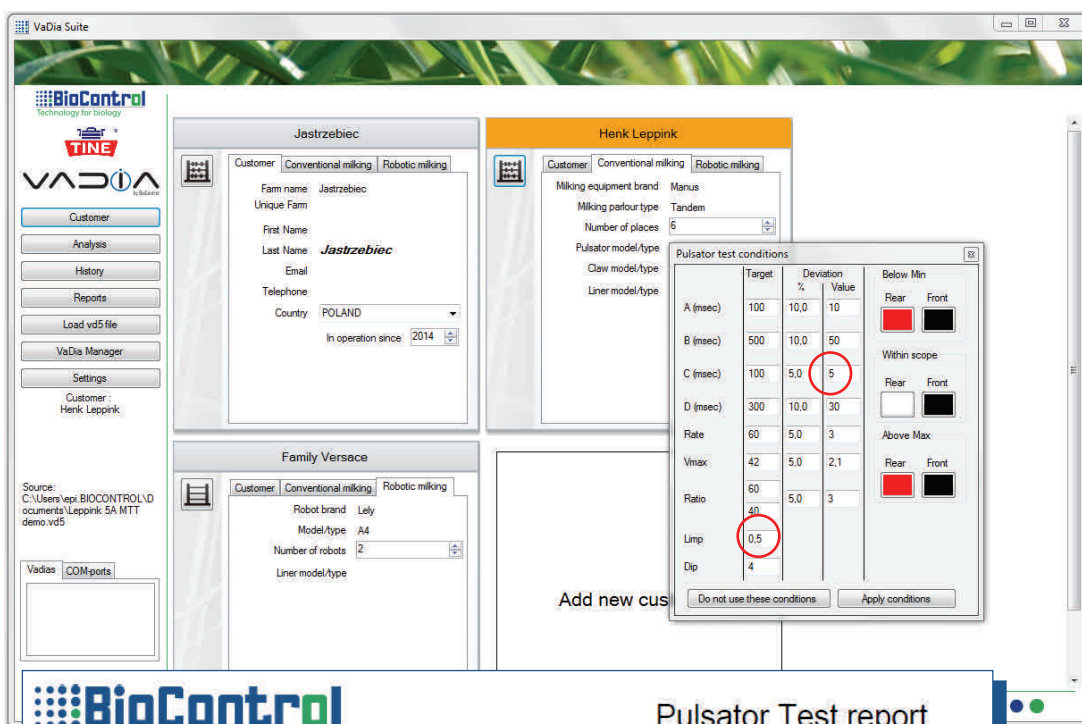
VaDia for pulsator test (T-pieces supplied in VaDia kit)



VaDia connected to milking cluster for pulsator dry-test

VaDia Suite for analyzing and report making

- Fully integrated PC-software with modules for
 - Milking Time Testing
 - Pulsator Testing (ISO 6690)
 - Cluster Falloff and Attachment testing (ISO 6690)
- Always work with latest features with automatic updating, no need to manually install updates
- Comprehensive customer database with installation details and results from previous tests
- Automatically compare pulsator and vacuum with customer set targets, deviations are highlighted
- Analyze MMT results and compare:
 - milking details, vacuum fluctuations, etc.
 - milking clusters, liners, vacuum drops, etc.
- Easy in-parlor assessment using Bluetooth
- Add company logo to the reports
- Reports are in XML, allowing organizations to (re-) design reports and add-on modules with DLL
- Available in many languages, including many Asian languages (contact us for update on available languages)



VaDia Suite contains a comprehensive customer database with relevant installation details

The pulsator test conditions can be set for each customer to accommodate different farms. Deviations from the targets are highlighted in the pulsator test report

Pulsator Test report

Customer
Henk Leppink

Advisor
BioControl

Test Date 2013-05-30



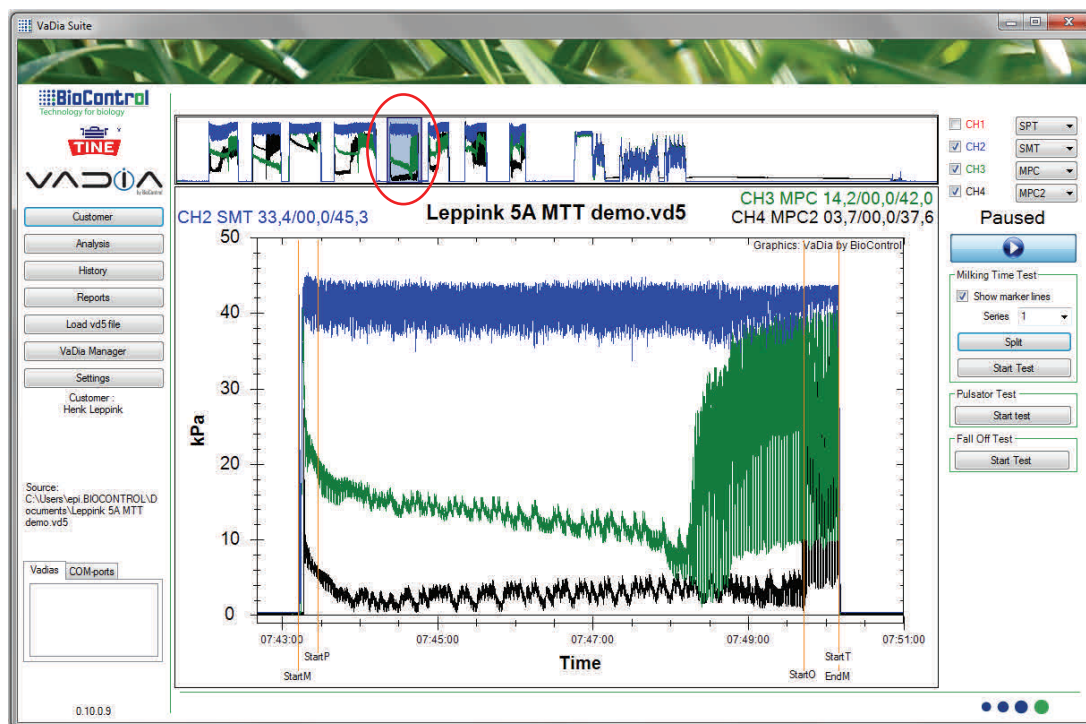
Pulsator Nr.	Chan	Rate (bpm)	Ratio	A (%msec)	B (%msec)	C (%msec)	D (%msec)	Vmax (kPa)	Limp	Dip
1	1	59,8	60,2 : 39,8	9,6 96	50,6 508	9,8 98	30,1 302	43,6	0,0%	
1	2	59,8	60,1 : 39,9	9,8 98	50,3 505	9,9 99	30,0 301	43,6	0,0%	
2	1	59,8	60,1 : 39,9	9,6 96	50,5 507	10,0 100	29,9 300	43,6	0,1%	
2	2	59,8	60,3 : 39,7	10,0 100	50,3 505	10,1 101	29,7 298	43,5	0,1%	
3	1	59,8	60,3 : 39,7	9,8 98	50,5 507	10,0 100	29,8 299	43,5	0,9%	
3	2	59,8	61,1 : 38,9	9,9 99	51,2 514	10,0 100	28,9 290	43,5	0,9%	
4	1	59,8	60,3 : 39,7	9,9 99	50,4 506	9,9 99	29,9 300	43,6	0,0%	
4	2	59,8	60,2 : 39,8	9,7 97	50,5 507	9,9 99	29,9 300	43,6	0,0%	
5	1	59,8	60,1 : 39,9	9,8 98	50,3 505	10,0 100	30,0 301	43,7	0,0%	
5	2	59,8	60,0 : 40,0	10,4 104	49,7 498	9,7 97	30,3 304	43,6	0,0%	
6	1	59,8	60,5 : 39,5	10,0 100	50,5 507	10,8 108	28,7 288	43,6	0,4%	
6	2	59,8	60,2 : 39,8	10,0 100	50,2 504	10,5 105	29,4 295	43,5	0,4%	

Reports are made as pdf for easy storing and emailing

The company logo can be added to the report

Deviations from the target are highlighted

VaDia Suite for analyzing and report making



The analysis function contains a 'navigation' window for keeping track where you are in the recordings and a 'zoom' window for displaying all details

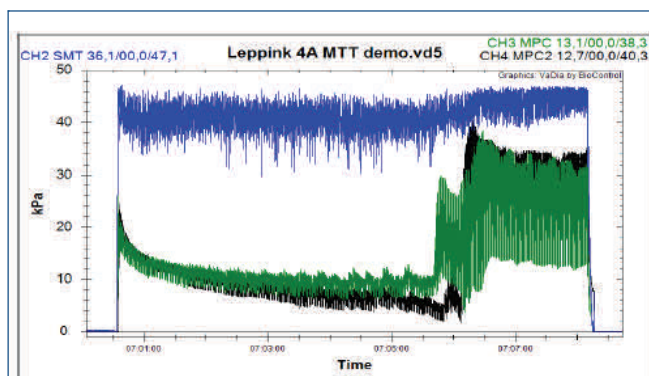
The zoom window is convenient for easy indication of average, min and max teat-end vacuum after one minute in the peakflow

CH2 SMT 39,9/35,7/45,7

Animal no	Milk yield	Machine on time	Overmilking time	SMT Total (kPa)	SMT PF (kPa)	SMT Overmilking (kPa)	MPC PF (kPa)	CVF Above (kPa)	CVF Below (kPa)	Irregular Vacuum Fluctuations	Average Milk Flow
123	15,8	06:30	01:36	40,1	38,9	42,6	31,3	5,8	-3,1	0	2,83
456	12,9	07:42	01:52	40,5	39,9	43,9	11,0	4,4	-3,0	0	1,67
789	18,3	11:20	03:11	41,4	40,7	44,3	26,4	5,2	-2,8	1	1,81
Series											
1	15,8	08:11	02:13	40,7	39,8	43,6	22,9	5,1	-3,0	0,33	1,91
Series											
1123	17,3	07:16	02:19	39,1	38,1	42,0	21,4	5,0	-4,4	1	2,38
1456	19,5	07:04	00:19	40,1	40,3	41,6	14,8	4,2	-2,4	3	2,76
1789	7,9	07:47	00:52	40,2	40,2	41,3	35,5	4,1	-2,2	3	1,01
Series											
2	14,9	07:22	01:10	39,8	39,5	41,6	23,9	4,4	-3,0	2,33	2,02
Total											
6	15,3	07:46	01:42	40,2	39,7	42,6	23,4	4,7	-3,0	1,33	1,96

The MTT report lists the summary of all test results on the first page.

Data from different VaDia's are listed as separate series so that MTT results from different milking points can be compared



Animal Id	456
Machine on time	7:42
Overmilking	1:52
Average short milk tube vacuum	
Total milking	40,5
Peak flow period	39,9
Overmilking	43,9
Cyclic vacuum fluctuations	
Above average	44,8
Below average	37,4
Average PFP MPC Vacuum	11,0
No Irregular vacuum fluctuations	0
Average Milk Flow	1,67
Milk yield	12,90

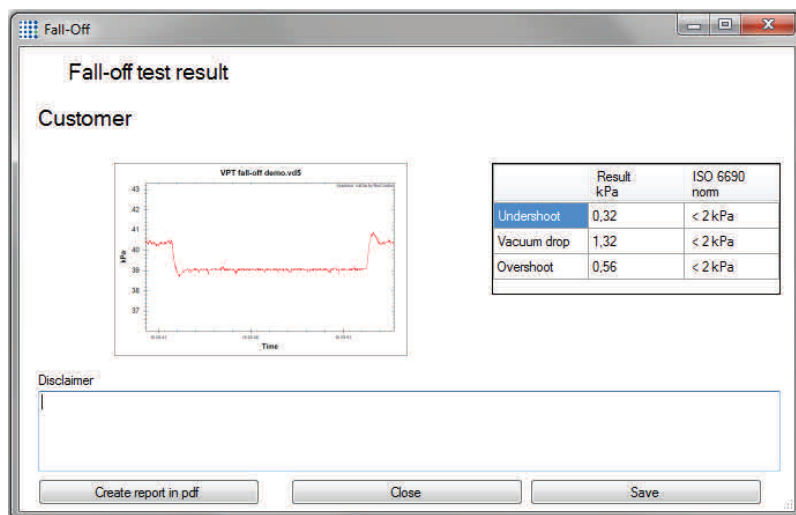
All individual MTT results with graphs are listed on the next pages of the report to visualize the milking details to the farmer

Cluster Falloff and Attachment Test with VaDia

The objective of the cluster falloff and attachment test is to test if the vacuum recovery is in accordance with the ISO 6690 standard, which is mandatory in certain countries. The VaDia Suite contains a module to test if the vacuum recovery is according to the standard.



VaDia connected to the milk receiver at point Vm (test point may vary due to local legislation)

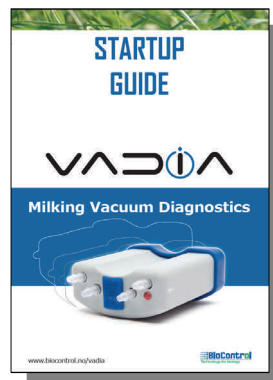


VaDia Kit is complete, in robust transport case



The VaDia kit includes:

- 1 or 2 VaDia's
- USB cable, Power Supply
- Piercing needle
- Box with accessories
 - T-pieces
 - Milk filter holders
 - Milk filters
 - Steel tubes
- Roll of silicon tube
- PC-program 'VaDia Suite'
- Startup Guide



BB 14001-1 VaDia/6. Specification may be changed without prior notice.

Headquarter: BioControl AS, Grimstad Gård, N-1890 Rakkestad, Norway — info@biocontrol.no — www.biocontrol.no

N-America and Mexico: BioControl N-America, 118 N. Conistor Lane STE B327, Liberty, MO 64068, USA — info@biocontrolna.com — www.biocontrolna.com

