



## Here you will find:

- 
- GraviDos® Gravimetric Dosing
  - AlfaDos™ Controlled Dropping Funnel
  - Pumps and Dosing Pumps
  - Vacuum Pumps
  - Reactant mixing pump
  - Multi-Channel Dosing Systems
  - SoliDos™ Solid Doser
-

## Controlled Dropping Funnel GraviDos®



The innovative dosing system GraviDos functions as a classical dropping funnel according to the force of gravity principle and consequently does not need any pumps. Due to this, the problems which always occur with pumps, like media incompatibility, suction problems, bubbles, etc. are eliminated. The integrated weighing system requires so little space that several dosing-units can be integrated without problems into a compact laboratory.

In addition, it results in a considerable saving of cost since no expensive balances and pumps are needed.

### Fields of Application

- Gravimetric dosing
- Tank content measurement
- Reactor content measurement
- Mass flow rate measurement
- pH-control
- Titration

A GraviDos system consists of a glass feed tank which is hung on the weighing system. The weight change is registered and the drain controlled by a magnetic valve. It consists of a real mass flow rate control, which does not have to be "metered" for different materials and remains unaffected by bubbling.

Optionally, a pulsation-free dosing can be achieved by deploying a proportional valve. Dosing under vacuum or pressure is possible, if a pressure compensation pipe is provided.

### Properties and Functions

- Low-cost gravimetric dosing
- Compact and robust
- No need for pumps
- Easy to clean
- Large dosing-range
- Refilling without dosing interruption
- Optional pulsation-free dosing
- Resistant to aggressive media
- Ex-suitable design available

The weighing systems are available graded from 1,5 kg to 15 kg, feed tanks from 500 ml to 2000 ml (above as a special production).

There are GraviDos-connection boards available for the connection of four or eight weighing systems.

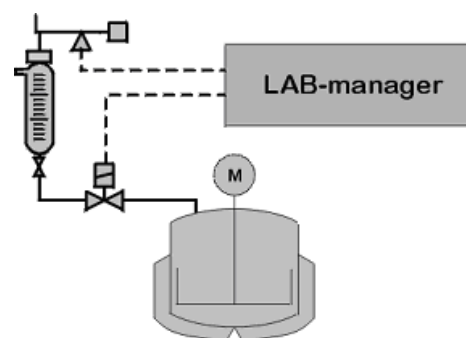
One GraviDos dosing device occupies a channel on the GraviDos board of the LabManager. An on/off valve occupies a channel on a digital-output-board.

A proportioning valve occupies a channel on an analogue-output-board.

For the dosage of liquids with high viscosity, an auxiliary pressure on the feed tank can be applied, if required.

A maximum of six GraviDos cards can be integrated into a PI, which corresponds to 24 channels.

A HiText example application is attached. For an operation with the recipe control system HiBatch, there is the base command „Dose Gravi" (SB-DOSGRAVI). This also allows refilling during operation without interrupting the dosing process.



GraviDos in a controlled circuit

A complete system consists of

- a feed tank
- a proportioning valve IV-MP-UK1 for continuous dosing or a magnetic valve IV-MB-FK1 for pulsed dosing
- a suspended balance IL-GRADO-xxxx,
- an external single channel measuring amplifier HK-GRADOMV1 to be connected to an analogue input socket
- an external single channel measuring amplifier HK-GRADOMV1 to be connected to an analogue input socket

**Alternatively:**

- an external, digital single channel measuring amplifier GRADOAMP1D for connection to a serial interface

**Alternatively:**

- a measurement card HK-AD24DMS4
- a LP- DMS4DA4PTR board for four channels (four controlled dosing circuits)

**Alternatively:**

- two measurement cards HK-AD24DMS4
- a panel LP-DMS4 for four channels (eight dosage controlled circuit s)
- a LP-DAP8T panel

**Alternatively:**

- a digital suspended balance to be connected to a serial interface

If automatic refilling is desired, further digital outputs and valves are required.

In case only one to two dosing circuits are required, it is possible to merely use the measurement amplifier HK-GRADOMV1 instead of a whole measurement system. It is connected to normal analogue input.

The optional Ex-adapter enables the operation of the GraviDos load cell in explosive environments.

In the standard version all parts in contact with media are only made of glass, ETFE and Kalrez . Custom designs made of other materials are available.

Blast protection category inherent control [Ex ia] IIC for zone 0.1 or 2 upon request.

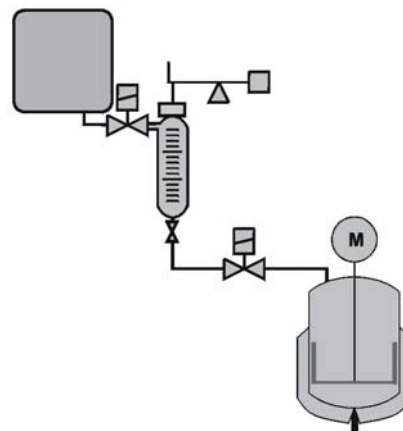
## Application Examples:

### Gravimetric Dosing (controlled dropping funnel)

The classical dropping funnel or dosing mechanisms with pumps and balances are replaced by GraviDos.

### Precise Dosing of large Amounts

The medium is automatically refilled from the reservoir. During the refilling-stage, the flow is optionally kept consistent or suspended.



GraviDos with feed tank

### Distillate Weighing

During fractioned distillation, the fractions are supposed to be weighed and individually bottled. The distillate is lead into a GraviDos receiver, and after the collection of a fraction, is bottled into vessels via a distribution valve. This assembly operates under vacuum and pressure.



Distillate weighing and separate bottling of the fractions: on the left: collection vessels, center: GraviDos distillate scales, right: rectification column

**Further information about GraviDos weighing cells can be found in the chapter Equipment and Components.**

### Technical Data

Resolution	Approx. 0.01% v.E.
Measurement uncertainty	Approx. 0.1% v.E.
Dimensions load cell (without linkages)	200x40x50mm

## GraviDos® suspended balance



The GraviDos dosing system is based upon a GraviDos suspended balance. In direct comparison to a lab balance it is extremely compact and suitable for process application.

## GraviDos® Standing Feed Tank

With the GraviDos desktop scales standing containers can also be used as feed tanks. The scale can be extended with a magnetic stirrer and a heating plate.

For further information see chapter Equipment and Components.



## GraviDos® pressure resistant



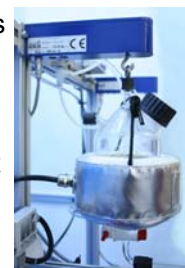
With the pressure resistant GraviDos tank the system can be operated up to 345 bar.

## GraviDos® heating jacket

With the GraviDos heating jacket it is possible to heat up the GraviDos receiver containers.

The heating jacket is connected to a switching socket. The heating output can be adjusted from 0 to 100%.

If the interior temperature is supposed to be controlled, it is necessary to install a temperature socket in the cover or an additional optional socket.



### Technische Daten

Power Supply	230 V, 1A
Weight	approx. 900 g
Max. Temperature	200 °C

## GraviDos® - Control Device for Stand-Alone Operation

The GraviDos-Stand-Alone System enables a gravimetric dosing control even without automation system. The setpoint flow rate, the final weight, and the dosing period can be preset via the installed operator interface as well as via serial or analogue interface.

The two-way valve necessary for flow control and the suspended scales of the GraviDos-System are connected directly.

The device is both suited for batch and continuous dosing. In addition, it also supports automatic refilling.

The optional Ex-adapter enables the deployment of the GraviDos load cells in explosive environments. Blast protection category inherent control [Ex ia] IIC for zone 0,1 or 2.



Order Code	Description
IL-GRAVIDOSST1	GraviDos control device for stand-alone operation
IL-GRAVIRS	Optional RS232 interface
IL-GRADOEX	Ex equipment of the GraviDos weighing module for zones 0.1 or 2

The GraviDos® control device for Stand-Alone Operation is compatible with all components and accessories of the GraviDos-System.

Order Code	Description
IL-GRADO1000D	Digital suspended balance 1.000 g for receiver tanks up to 500ml, incl. bracket, cable
IL-GRADO3000D	Digital suspended balance 3.000 g for receiver tanks up to 2000ml, incl. bracket, cable
IL-GRADO7000D	Digital suspended balance 7.000 g for custom made receiver tanks, incl. bracket, cable
IL-GRADO10000D	Digital suspended balance 10.000 g for custom made receiver tanks, incl. bracket, cable
IL-GRADO15000D	Digital suspended balance 15.000 g for custom made receiver tanks, incl. bracket, cable
IL-GRADO1000	Suspended balance with tank mounting 1000 g, for feed tanks up to 1000 ml, incl. cable
IL-GRADO3000	Suspended balance with tank mounting 3000 g, for feed tanks up to 2000 ml, incl. cable
IL-GRADO7000	Suspended balance 7000 g, for customized feed tank, incl. cable
IL-GRADO10000	Suspended balance 10000 g, for customized feed tank, incl. cable
IL-GRADO15000	Suspended balance 15000 g, for customized feed tank, incl. cable
HK-GRADOMV1	Measuring amplifier 1 channel external measuring amplifier to connect to an analogue input
HK-GRADOMV1D	External digital measuring amplifier, 1 channel to connect to RS232 V24 interface
IL-NGSAMP1D-SN	Power supply for digital measuring amplifier HK-GRADOAMP1D, HK-AINAMP1D, HK-PTAMP1D
HK-AD24DMS4PTR	Measurement system 4 channels, card w/o connection board for GraviDos suspended scales
LP-DMS4DA4PT	connection board with 4 channels for GraviDos, 4 digital inputs
LP-DMSP8	connection board with 8 strain-gauge channels for GraviDos (requires 2 times HK-AD24DMS4)
IL-GRAVLBB250	Feed tank* 250 ml, borosilicate glass, PTFE tap, GL 14 connection, weight: 250g
IL-GRAVLBB500	Feed tank* 500 ml, borosilicate glass, PTFE tap, GL 14 connection, weight: 350g
IL-GRAVLBB1000	Feed tank* 1000 ml, borosilicate glass, PTFE tap, GL 14 connection, weight: 550g
IL-GRAVLBB2000	Feed tank* 2000 ml, borosilicate glass, PTFE tap, GL 14 connection, weight: 900g
IL-GRAVLBGRAD	Grading of a feed tank (ml-scale)
IL-GRAVLBS150	Receiver tank 150 ml, 345 bar, high-grade steel 316L/ DOT-3A 5000 TC-3ASM
IL-GRAVLBS300	Receiver tank 300 ml, 345 bar, high-grade steel 316L/ DOT-3A 5000 TC-3ASM
IL-GRAVLBS500	Receiver tank 500 ml, 345 bar, high-grade steel 316L/ DOT-3A 5000 TC-3ASM
IL-GRAVIHEAT250	Heating jacket for GraviDos feed tank 250 ml
IL-GRAVIHEAT500	Heating jacket for GraviDos feed tank 500 ml
IL-GRAVIHEAT1000	Heating jacket for GraviDos feed tank 1000 ml
IL-GRAVIHEAT2000	Heating jacket for GraviDos feed tank 2000 ml
IL-GRAVIHEATSON	Heating jacket for GraviDos custom design
IV-MB-FK1-2-1,5-UNF-ea	Universal 2/2 way lab valve ETFE, FFKM, nominal diameter of 1.5 mm, Kv 0,06 m <sup>3</sup> /h, 0 to approx. 3 l/h media connector 1/4" UNF with cables of 3 m for the connection to LAB-PI or MSR-PI
VL-KB-MB-FK1	Fixing element to connect small and medium sized HiTec Zang valves to LAB-kit-ALU-system. Please state exact valve type when ordering .
IV-MP-UK1-2-0,8-ma-ea	2/2 way proportional magnetic control valve, FPM, nominal diameter of 0.8 mm, Kv 0.02 m <sup>3</sup> /h, with cables of 1.5 m for the connection to LAB-PI or MSR-PI
IV-MB-UM2-2	2/2-way- high-pressure-valve, 420 bar, 24V, 4 A
IV-MB-UM2-PS	Power supply for 2/2-way- high-pressure-valve, 24V, 4 A, with auxillary relay
VL-KB-MB-UM2	Valve-connection piece to connect one V-MB-UM2-2 valve to LabKit-ALU-system
IL-GRADOADV	Adapter round measurement cell reducing adapter to 12 mm tube construction systems
IL-GRADOADR12	Adapter-round manifold for measuring cell on to 12 mm tube construction system
IL-GRADOADR14	Adapter-round manifold for measuring cell on to 14 mm tube construction system
IL-GRAVI-KAL1000	Calibration weight 1000g
IL-GRAVI-KAL2000	Calibration weight 2000g
IL-GRAVIDOSST1	GraviDos control device for stand-alone operation
IL-GRAVIRS	Optional RS232 interface
IL-GRADOEX	Ex equipment of the GraviDos weighing module for zones 0.1 or 2
IS-W-GRAVISTAND	Table stand with leveling screws
IS-W-GRAVIPLATE	Weighing plate diameter 140mm
IS-W-GRAVICRANE	Three element pivot lift crane for tube guidance into open weighing containers
SL-GOPGRAVITARI	HiBatch basis operation: Taring a load cell
SL-GOPDOSIGRAVI1	HiBatch basis operation: gravimetric dosing without refilling option

\*with additional GI14 connection above for venting or pressure compensation \*\* higher Kv values and other materials upon request

ma = Medienanschluss:

SN4/6	Verschraubung für Schlauch mit Durchmesser innen/außen 4,0/6,0 mm
GMG1/8	Gewindemuffe G 1/8"

ea = Elektrischer Anschluss

T	Tuchel-Stecker für LAB-PI
O	offene Enden für MSR-PI

## Controlled Dropping Funnel AlfaDos™

The dosing system AlfaDos functions like the classic dropping funnel according to the force of gravity principle or supported with pressure and, like these, does not need any pumps. Due to this, the problems, which always occur with pumps, such as media incompatibility, suction problems, bubbles, etc. are eliminated.

In addition, it leads to a considerable saving of expense since no expensive balances and pumps are needed. The flow is controlled via a magnetic valve. As there is no measurement or control of the flow rate, the dosing rate is not particularly accurate. In some cases, for example during the pH-adjustment, the consistent compliance to a specific dosing-rate is however not so important. In this case AlfaDos is the absolute the lowest-cost solution.

### Application fields

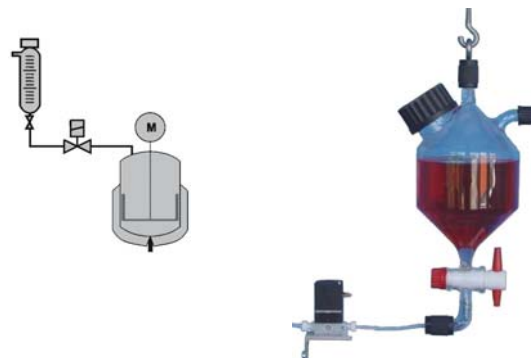
- Simple dosing tasks
- pH-control
- RedOx-adjustment
- Titration
- Dosing depends on process sizes

An AlfaDos system consists of a supply vessel of glass, stainless steel, or synthetic material. The drain occurs due to the force of gravity or applied pressure and is controlled via a magnetic valve.

Dosing under pressure or vacuum is possible if pressure compensation pipe is provided..

### Applications:

The classical dropping funnel or dosing mechanisms with pumps and balances are replaced by AlfaDos, if the requirements regarding the stability of the dosing rate are modest, or the dosing is adjusted in dependency to another variable, for example the pH value or the RedOx potential, or if a controlled variable, such as the temperature, is deployed as a process signal.



In the standard version, any material in contact with media is made glass, PTFE and PVDF. Special versions in other materials are also possible.

An AlfaDos dosing device occupies a channel for the valve on a digital-output-board.

### Properties

- Low-cost
- Compact and robust
- Does not need pumps
- Resistant to aggressive media
- Easy to clean

### Technical data

Viscosity range	0,1...100 mPa s
Pressure range	0...1 bar abs. (for overpressure on request)
H2O flow range (di=2 m <sup>3</sup> , h=50cm, no pressure)	up to 100 ml / min
H2O flow range (di=1 m <sup>3</sup> , h=50cm, no pressure)	up to 20 ml / min
H2O flow range (di=2 m <sup>3</sup> , auxiliary pressure of 1 bar)	up to 500 ml / min

Order Code	Description
IL-GRAVLBB250	Feed tank* 250 ml, Borosilicate glass, PTFE tap, GL 14 connection, 250 g
IL-GRAVLBB500	Feed tank* 500 ml, Borosilicate glass, PTFE tap, GL 14 connection, 350 g
IL-GRAVLBB1000	Feed tank* 1000 ml, Borosilicate glass, PTFE tap, GL 14 connection, 550 g
IL-GRAVLBB2000	Feed tank* 2000 ml, Borosilicate glass, PTFE tap, GL 14 connection, 900 g
IV-MB-FK1-2-1,5-UNF-ea	Universal 2/2 way lab valve PVDF, FFKM, nominal diameter of 1,5 mm, Kv 0,06 m <sup>3</sup> /h, 0 to approx. 3 l/h, media connector 1/4" UNF, 3m cables for the connection to LAB-PI or MSR-PI
VL-KB-MB-FK1	Valve to valve fixing element for LAB-kit-ALU-system

\*with additional GI14 connection above for aeration or pressure compensation \*\* higher Kv values and other materials on request

ea = Electrical connection

T	Tuchel plugs for LAB-PI
O	open ends for MSR-PI

## Pumps, dosing pumps



Pumps, just as valves, have an important role in laboratories and pilot plant stations. Their variety is nearly unmanageable as they are needed for conveying, circulating or detailed volume dosing of the smallest to bigger material flows, across a large scale of viscosity values even with solids or for emulsions. Also the dosing of gases and the evacuating of plants belongs to the application area.

Here, you can also expect our competent advice and individual lay out design especially for your application. Our know-how stretches over the most famous manufactures like: HiTec Zang Prominent, Lang, Gather, Ismatec, Speck, Lewa and many more, so that we can also help you with realising special tasks.

### Areas of Application

- Circulation of heating and cooling media
- Dosing of ingredients
- Transport of ingredients, intermediate and final products
- Generation of pressure, e.g. in pressure reactors, for filtering
- Generation of vacuum
- Ex-area zone 1 and 2 with pressure enclosed ex-three-phase motor, respectively special versions.

### Which Pump for which Application?

For the most important tasks in the laboratories and pilot plant stations, you can find approved standards under "First Choice", which will help you to make your choice. With help of the following table, you can find the appropriate pump for various applications.

In case of doubt, clarify with our project department which application you need.

### Here you will find:

- Peristaltic pumps
- Pneumatic pumps
- Magnetic membrane dosing pumps

### Advantages, performances

- All pumps are directly controllable from HiTec-PIs
- Feedback from operation parameters to monitor when required
- Cables and plugs for the direct connection with your LAB-xxx or MSR-xxx PI available
- Hydraulic design and tuning to the media in your plant, available auxiliary power etc. by our engineering department
- Special modifications to your control tasks by variable displace volumes, frequency converter...
- We search and deliver also special accessories and we deliver your pump as a ready to use device
- On request, bonding into your application program by our application programmer
- On request, design, construction and parameterising of your control circuit by our engineering department
- Advise and adjustment to your existing automation devices completely from one source

- Magnetic piston dosing pumps
- Positive displacement dosing pumps
- Syringe dosing
- High pressure double piston dosing pumps
- Eccentric spiral pumps
- Tooth ring pumps
- Micro-tooth ring pumps
- Centrifugal pumps
- Membrane vacuum pumps
- Rotary valve vacuum pump

Application \ Type	IP-P-LabDos-P..	IP-P-SM1..	IP-P-M1..	IP-P-P1..	IP-P-M2..	IP-P-m <sup>3</sup> ..	IP-SYRDOS..	IP-P-LabDos-T..	IP-P-P3..	IP-P-E1..	IP-P-S1..	IP-P-S2..	IP-P-Rx..	IP-P-Z1..	IP-B-K1..	IP-B-K2..	IP-B-V1..	IP-B-V2..	IP-B-VPS..
<b>dosing</b>																			
fluids	+	+	+	+	+	+	+	+	+	+	+	+	+	+					
aggressive	+	+	+	+	+	+	+	+	0	+	0	0	0	+					
suspensions	+					+	+	0		+	0		+						
viscous	+	0				+	+	0		+	0	0	+	+					
abrasive	+					+	0	0		+									
outgassing	+					+					0		0	0					
high pressure	0	0		+				0					+	+					
very high pressure									+										
in vacuum	+		0	+	0	+	+	0	0	0	+		0	+					
volumetric	+	+	+	+	+	+	+	+	+	+	+	0	+	+					
gravimetric in control circuit	+	+	+	+	+	0	0		0	+	+	+	+	+					
small quantities	+	+		+		+	0	+	+	0	+		+	0					
multi-channel	+										+								
melting		0				0				+			+						
gases	+		0	0	0	+					0								
<b>conveying / circulation</b>																			
fluids	+	+	0	0	0	0	0	0	0	+	+	+	+	+	+	+			
aggressive	+	+	0	0	0	0	0	0	0	+	+	0	0	+	+	+			
abrasive	+					0	0			+									
viscous	+					0	+	0		+	0	0	+						
heat carrier														0	+	0			
flammable (solvent)	+	+	0	0	0	0	0	+		0	0	+	0	+	0	0			
high temperatures		0				0				+					+				
gases	+		0	0	0	+											+		
<b>vacuum</b>																			
rough	+																	+	+
fine	0																	+	0
aggressive vapours	+																	+	0
<b>general characteristics</b>																			
self-priming	+		+	+	+	+		+		0	+	0	+	+					
pulsation free	0	0						0	+	+		+	+	+	+	+			
bi-directional flow	+																		
warming up		+				0		0					+						
steriliseable	+																		
ex-application				0	+					0		0			0	0			

+ = well suitable, 0 = conditional suitable, upon request

## First Choice Types for Laboratories and Pilot Plants

In the following you can find a suitable pump for every application.

To make clear which pump you need, we need some information from you. It is also possible to consult one of our engineers and find out together the needed information.

### What we will ask you:

#### Applications:

- Dosing: volumetric, gravimetric in a control circuit ...
- Circulation, conveying: cooling- heating media, solvents...

#### Convey media:

Particular features: density, viscosity, flammable, explosive, conductivity, aggressive, emulsion, suspension, abrasive, crystallise...

#### Convey quantity / range

#### Media temperature / range

#### Vapour pressure at operation temperature

#### Self-priming / supply / primary pressure

#### Ambient temperature

#### Connections:

used / wished piping, tubes, and connecting parts?

#### Bonding in a control circuit:

Actual value – signal transmitter, control accuracy, control velocity, noise magnitudes, linking with other control circuits / controllers...

#### Particular requirements:

Safety aspects, cleaning possibilities, CIP-compatible etc.

## LabDos™ Peristaltic Pump

### Superior dosing technology: One fits all!



Selection criteria for pumps are their dosing range, precision of dosing, media compatibility, viscosity range, interface types etc. The LabDos laboratory dosing pump fulfils many different criteria at a remarkable low price. LabDos is suited for dosing into reaction systems, transferring between tanks, sampling from vessels, for automatic sample drawing and for other liquid handling processes.

The path breaking **SofDrive™ drive technology** combines the advantages of a servo motor and the step motor. The drive disposes of the robustness, the extremely broad revolution range, the absolute precision and the high durability of a step motor, but does however not show the pulsating running characteristics of the same. The SofDrive™ builds a perfect team with **Watson Marlow** and **Masterflex**.

Large pushbuttons allow changing settings even with thick gloves. The wide display is illuminated, a wide viewing angle is ensured. It is suited both for stand-alone operation, as well as within automation systems.

#### Properties of LabDos dosing pumps:

- Universal use
- Extremely large dosing range
- Pulsation free high-precision drive
- Revolution direction reversible
- May be calibrated in g/min and ml/min
- Robust and compact stainless steel housing
- Optional separated pump head
- Fast mode for aspiration, drain, flushing
- Manual and external control
- Ergonomic and intuitive handling
- Stackable

The simple functional principle of a peristaltic pump enables its cost efficient use from pumping to complex fluid handling requirements. The pump head is mounted on a sloped front for easy handling and maintenance.

The LabDos peristaltic pump is a displacement pump, where outer rolls will drive the liquid through a hose. The conveyed media will therefore not touch any metal, the hose is the only media touching material. A contamination of pump and media is impossible.

The gentle functional principle assures a safe conveying of high viscous, abrasive, aggressive, scher-sensitive, foaming, gas or solid loaded, pure and valuable as well as explosive liquids and gases.

#### Advantages of the LabDos peristaltic pump:

- Free of dead storage
- Self priming
- Direct displacement against pressure
- Low pulsation
- High viscosity range
- No valves or seals
- Suction from 50 mbar vacuum
- High media resistance, inert, hygienic
- Suitable for media with solid particles
- Dosing of shear strain sensitive fluids
- No problems with bubbles
- Fluid path visible
- Easy to clean, easy maintenance
- Monitoring of hose run time
- Exchangeable pump head (optional)

In combination with a GraviDos system, LabDos pumps may be used for gravimetric dosing.

At the LabDos-Vario, it is possible to exchange the pump head without having to use any tools. Available are single head, double head, as well as 5 and 10-fold cassettes.

FDA and USP23 Class VI conform hoses are available. With the development of new hose material the life expectancy was highly increased eg. HPT-Ultra hose times fifty. The HPT-Ultra hose is suitable for nearly all aggressive chemicals, including organic solvents like MEK, THF and Toluol or acetone.

The following comparative matrix illustrates that the LabDos peristaltic pump possesses more advantages than any other pump and is therefore universally deployable!

The following comparative matrix illustrates that the LabDos peristaltic pump possesses more advantages than any other pump and is therefore universally deployable!



## Pump characteristics compared

	Peristaltic pump	Diaphragm pump	Gear pump	Plunger pump	Syringe pump
Dosing range	++	0	++	+	++
Exact dosing of small volumes	++	0	0	+	++
Direct displacement against pressure	+	+	-	++	++
Bidirectional pumping	++	--	++	0	++
Pulsation free	+	--	++	--	++
Continuous feeding	++	0	++	0	++
Pumping of shear strain sensitive fluids	++	++	-	0	0
Fluids containing abrasive solids	++	-	-	-	-
High viscous media	++	--	++	-	-
Self-priming	++	--	--	++	++
Dosing from/to vacuum	++	0	--	++	++
Without dead storage	++	--	--	--	0
Self locking	++	--	--	--	++
Safe dry running	++	0	--	--	-
Autoclavable	++	--	--	--	--
Chemically persistent	+	+	0	+	+
100% decontamination	++	--	--	--	--
Easy maintenance	++	0	0	0	++
Price/performance ratio	++	+	0	--	+

## Technical Data

Pump head	P30	P100	Easy-Load	Easy-L.-dual	Vario4(3)
Dosing range	1 µl to 30 ml/min	10 µl to 100 ml/min	0,2ml to 1,1 l/min	0,1ml bis 0,5 l/min	0,1ml bis 1(1,2) l/min
Hose inner diameter	0,25 to 2,4 mm	0,5 to 4 mm	0,8 to 8 mm	0,5 bis 4,8 mm	0,5 bis 8 mm
Wall thickness	0,85 mm	1,6 mm	1,6mm	1,6mm	1,6mm
Supply pressure	0..2 bar	0..2 bar	0..2,5 bar	0..1,5 bar	0..2,5 bar
Revolution speed	0,01.. 300 rpm	0,01.. 200 rpm	0,01.. 300 rpm	0,01.. 250 U / min	0,01.. 250 U / min
Viscosity	0...150.000 cps, newt.	0...150.000 cps, newt.	0...150.000 cps, newt.	0...150.000 cps, newt.	0...150.000 cps, newt.
Communication Interfaces	RS232. optionally RS485 (ModBus or CAN) and analogue (0–5V/4–20mA)				
RS485 Mod-bus (opt.)	Up to 32 pumps using one serial interface				
Digital input (TTL)	Start/Stop, revolution direction				
Drive	Pulsation-free SofDrive™ precision drive				
Power Supply	24V DC, 600 mA , Easy-Load Vario: 24V DC, 1A				
Protection Class	IP 20				
Dimensions	D / W / H 250 x 165 x 110 mm				
Weight	approx. 2 kg				

The projected values are maximum values. They are dependent on tubing material, pressure and viscosity. Other pump heads are

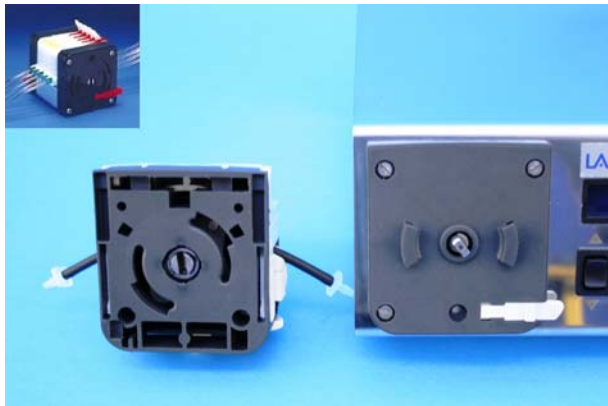
available on request.



LabDos P100, with adjustable hose fitting



LabDos-P-Easy-Load pump



LabDos-vario drive with fast exchangeable and stackable pumpheads



Vario-4 pumphead open



Stack of Vario-3 and Vario-3E pump heads



LabDos-P30 pump with fast-loading mini pump head

The LabDos-Easy-Load pumps allows the use of a further Easy-Load for parallel dosing.

With the stackable extension pump head VARIO-4E and VARIO-3E it is possible to extend the LabDos-vario to multiple traces.

**Hint:** By parallel dosing with two stackable Vario3/Vario3-E or two Easy-Load pump heads, an outstanding pulsation free feeding over the total feeding amount can be achieved.

Order Code	Description
IP-P-LABDOS-P30	LabDos Pump with mini pump head max. 30 ml/min, RS232 Interface
IP-P-LABDOS-P100	LabDos Pump with single pump head max. 100 ml/min, RS232 Interface
IP-P-LABDOS-P-EASYLOAD	LabDos Pump with pump head Easy-Load, 3 rolls, max. revolution speed 300 rpm
IP-P-LABDOS-P-EASY-E	Extension pump head Easy-Load, 3 rolls, max. revolution speed 300 rpm
IP-P-LABDOS-P-EASY-DUAL	2 Channel pump head Easy-Load, 3 rolls, max. revolution speed 300 rpm
IP-P-LABDOS-P-EASY-TC	Twin channel pump head Easy-Load, 3 rolls, max. revolution 300 rpm, max. 500ml/min
IP-P-LABDOS-P-VARIO	LabDos Basic unit without pump head, RS232 Interface
IP-P-LABDOS-P-VARIO-3	Peristaltic pump head for vario, 3 rolls
IP-P-LABDOS-P-VARIO-3E	Peristaltic stackable extension pump head for LabDos vario, 3 rolls
IP-P-LABDOS-P-VARIO-4	Peristaltic pump head for vario, 4 rolls
IP-P-LABDOS-P-VARIO-4E	Peristaltic stackable extension pump head for LabDos vario, 4 rolls
IP-P-LABDOS-P-MULTI-4-5	Pump head 5-fold maximum revolution speed 100 rpm, 4 rolls
IP-P-LABDOS-AE	Analogue interface/input revolution control (0–5 Volt and 4–20mA)
IP-P-LABDOS-SK	Flexible protection caps for push buttons
CZ-USB-RS232	USB/RS232 converter cable USB/Sub-D9, 3 m, connects USB and RS232 interface
IP-P-LABDOS-RS232BA	RS232-T-bus adapter for a pump, max. 4 pumps at a single RS232 interface possible
ZK-P-HI36-BS-R2-I-01	RS232 cable Sub-D9/Sub-D9, 3 m, to connect a LAB- or MSR-PI or PC
ZK-P-HI36-BS-R2-I-02	RS232-bus cable Sub-D9/Sub-D9, 0,3 m, to connect of a RS232-bus adapter
IP-P-LABDOS-RS485	RS485 bus connector, control of up to 32 pump via a serial interface
IP-P-LABDOS-RS485BA	RS485-T-bus adapter for a pump
ZK-P-HI36-BS-R4-I-01	RS485 cable Sub-D9/Sub-D9, 3 m, to connect a LAB- or MSR-PI or PC
ZK-P-HI36-BS-R4-I-02	RS485-bus cable Sub-D9/Sub-D9, 0,3 m, to connect a RS485-bus adapter
IP-P-LABDOS-DISPENS	Optional dispenser mode for LabDos, dosage of predefined volumina and amounts
IP-P-LABDOS-DISPPB	Pushbutton for LabDos, to trigger dosage start
IP-P-LABDOS-DOMAS	DosiMaster™ Software for dosage profiles and graphical charts
CG-LABCOMMANDER	LabCommander mini-terminal for laboratory devices

## Order Examples:

LabDos basic unit with four-wheel pump head plus extension head and analogue interface.

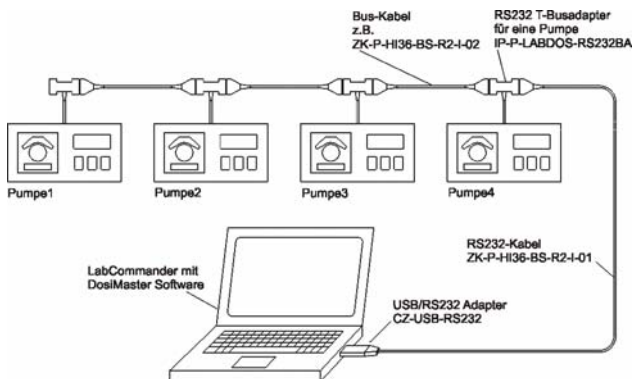
**IP-P-LabDos-P-VARIO**  
**IP-P-LabDos-P-VARIO4**  
**IP-P-LabDos-P-VARIO4E**  
**IP-P-LabDos-AE**

## LabDos Extensions

### The LabDos Bus System

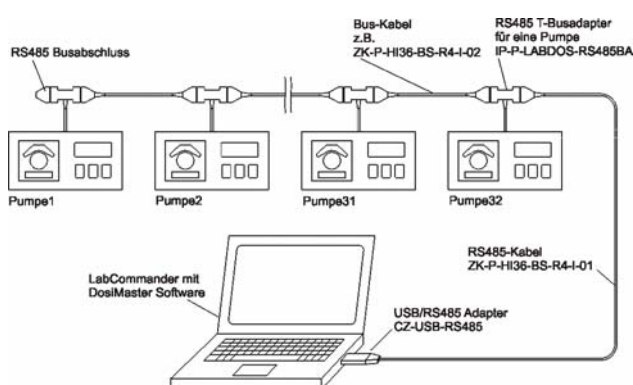
All LabDos pumps are bus-compatible. The user is able to choose between a RS232-based or a RS485-based bus system. With the basic RS232 bus, up to four pumps can be connected to a normal RS232 or, using the converter cable CZ-USB-RS232, to a USB interface.

The optional RS485 Bus IP-P-LABDOS-RS485 enables the connection of up to 32 pumps to a RS485 interface. Subsequently, a IP-P-LABDOS-RS485BA bus adaptor is required for each pump. The bus adaptors are connected to each other with a bus cable of the required length.



RS232 Bus for up to four Pumps

Subsequently, a LABDOS-RS232BA bus adaptor and a RS232 cable is required for each pump.



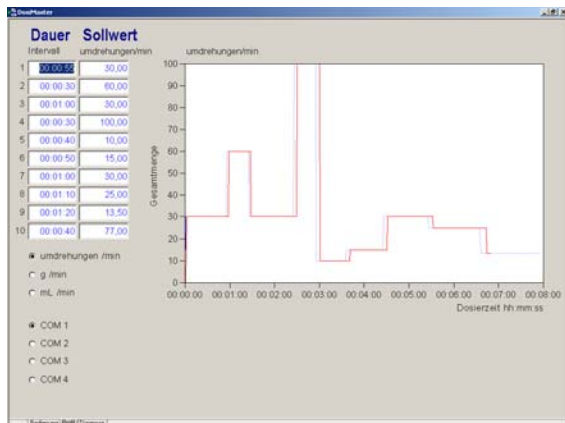
RS485 Bus for up to 32 Pumps

## LabDos Dispenser

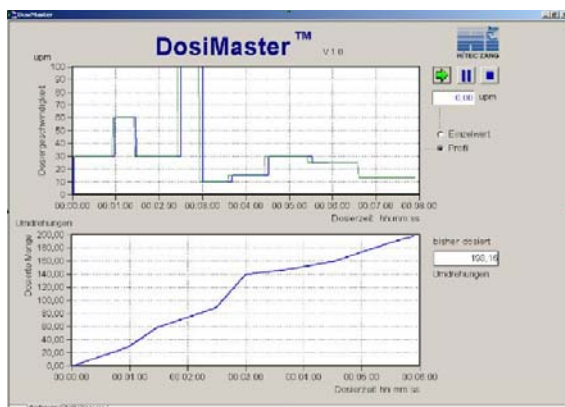
With the Dispenser extension, a LabDos pump becomes an independent dispenser. This enables the dosing of pre-set volumes or amounts. A dispensing process can be started using an external push-button (IP-P-LABDOS-DISPPB). This means that the set amount is dosed at the set dosing rate with every actuation of the push-button.

## LabDos PC Software

With the **DosiMaster™** software, it is possible to establish dosing profiles in an easy manner.



The dosed amount is logged and graphically presented as a cumulative curve.



The software can be extended through additional functions such as protocol print-out or data export to LIMS.

## Multi-Component-Mixer

The Component-Mixer-Function is an extension of the DosiMaster™ software. It enables multi-component mixing in batch and continuous operation through simultaneous activation of up to eight LabDos pumps.

In batch operation mode, a mixture of up to eight components is established upon the actuation of a button. Hereby, it is possible to pre-set the amounts of the individual components or the mixing ration and the total amount.

In continuous operation mode, the flows of the components intended for mixing, as well as the ratios in percent of the individual components, are preselected.

## LabCommander – Mini-Bedienstation

Das LabCommander mini-Notebook ermöglicht die platzsparende Realisierung von Dosier-, Dispensier- und Mischstationen auf dem Labortisch.



Order Code	Description
CZ-USB-RS232	USB/RS232 Converter Cable USB/Sub-D9, 3 m to connect USB and RS232 interface
IP-P-LABDOS-RS232BA	RS232-T-Bus Adaptor for one Pump, max. 4 pumps possible at a RS232 interface
ZK-P-HI36-BS-R2-I-01	RS232 Cable Sub-D9/Sub-D9, 3 m for connection to LAB- or MSR-PI or PC
ZK-P-HI36-BS-R2-I-02	RS232-Bus Cable Sub-D9/Sub-D9, 0,3 m, for connection of RS232 Bus Adaptors
IP-P-LABDOS-RS485	RS485 Bus Connection, activation of up to 32 pumps via a serial interface
IP-P-LABDOS-RS485BA	RS485-T-Bus Adaptor for one pump
ZK-P-HI36-BS-R4-I-01	RS485 Cable Sub-D9/Sub-D9, 3 m for connection to LAB- or MSR-PI or PC
ZK-P-HI36-BS-R4-I-02	RS485-Bus Cable Sub-D9/Sub-D9, 0,3 m, or connection of RS485 Bus Adaptors
IP-P-LABDOS-DISPPB	Dispensing-Option for LabDos with push button to trigger dispensing processes
SA-P-LABDOS-DOMAS	DosiMaster™ Software for dosing profiles and graphical presentation of the cumulative curve
SA-P-LABDOS-DOMASM	DosiMaster™ Extension: Mixer Function
CG-LABCOMMANDER	LabCommander Mini-Control Station for Laboratory Devices

## Maximum delivery rates in ml/min, dependant of hose diameter and pump:

Di/ mm	P30 (at 290 rpm)	P100 (at 200rpm)	VARIO-3 (at 250 rpm)	VARIO-4 (at 250 rpm)	Easy-Load (at 300rpm)	P30 (per rev)	P100 (per rev)	VARIO-3 (per rev)	VARIO-4 (per rev)	Easy-Load (per rev)
0,25	0,73	--	--	--	--	0,0025	--	--	--	--
0,5	2,8	3	7,5	7,5	--	0,0095	0,015	0,03	0,03	--
0,8	5,8	7	15	15	18	0,025	0,035	0,06	0,06	0,06
1,6	20	22	65	62	75	0,07	0,13	0,26	0,25	0,21
2,4	35	48	125	100	113	0,12	0,25	0,5	0,4	0,35
3,2	--	82	250	212	240	--	0,41	1	0,85	0,8
4,0	--	118	325	275	310	--	0,52	1,3	1,1	1,0
4,8	--	--	550	475	500	--	--	2,2	1,9	1,7
6,4	--	--	900	750	850	--	--	3,6	3	2,8
8,0	--	--	1250	1000	1150	--	--	5	4	3,8

All value are depended on hose material and media. All values are only for orientation purposes.

## IP-P-LabDos-P-MULTI-4-5.

Maximum delivery rates in ml/min:

Di/ mm	IP-P-LabDos-P-MULTI-4 (in ml at 110rpm) approx.
0,13	0,1
0,25	0,5
0,59	2,5
0,63	3
0,89	7
1,02	9
1,3	16
1,42	18
1,52	20
2,06	33
2,54	47
2,79	55

advice you which hose are best suited for you media.

Samples can be sent upon request.



If in doubt please get in touch with us. We will

## Compatibility of Hose Materials

Hose	Acid			Base			Solvent					Others		Remarks
	weak	Mid	strong	weak	Mid	strong	aliphatic	aromatic	halogenated	alcohols	aldehyde/ketone	salt	oxidants	
HPT-Silicon (Platin)	+	o	-	+	+	+	-	-	-	o	-	+	o	*) These first class attributes do not guarantee a resistance to all chemicals. Some solvents cause swelling of the hose (e.g. Hydrocarbon, amine, CHC and other solvents). In case of doubt please order test probes.
HPT-PVC	+	+	-	+	+	+	-	-	-	-	-	+	o	<b>very inexpensive</b> , very good mechanical attributes, contains diluent. Non solvent resistant. <i>clear</i>
HPT-FuelOil	+	o	-	+	o	-	+	-	-	+	-	+	-	Special hose for <b>motor fuels and oils</b> . <i>yellowish</i>
HPT-Neopren	o	o	-	+	o	o	-	-	-	o	-	+	o	<b>pressure/vacuum</b> resistant, high lifetime expectancy, inexpensive <i>black</i>
HPT-Chem	+	+	+	+	+	+	-	-	-	+	o	+	+	Flexibiliser free, inexpensive. Limited resistance to ketone. <i>clear</i>
HPT-Viton®	+	+	+	+	+	+	+	+	+	+	-	+	+	Highly resistant, inexpensive. <i>black</i>
HPT-Pharm	o	o	-	+	o	o	-	-	-	o	-	+	o	<b>pressure/vacuum</b> resistant, high lifetime expectancy, FDA, USP, cell culture. <i>light beige</i>
HPT-Ultra*	+	+	+	+	+	+	+	+	+	+	+	+	+	Extremely high life cycle and highly resistant, expensive. <i>dim white</i>

+ Resistant: None or only minimal swelling, None or only minimal restriction of life span.

- o Limited resistance: Moderate swelling, restriction of life span. Must be tested in individual case.
- Not resistant: Strong restriction of life span or complete destruction of the hose.

## Availability with 1.6 mm wall thickness

For LabDos P100, Vario and Easy-Load, not suitable for P30 and MULTI-4

Di/ mm	HPT-Silicon	HPT-PVC	HPT-FuelOil	HPT-Neopren	HPT-MHL	HPT-Viton®	HPT-Ultra	coupling (2 pcs.)
0,8	+	+	+	+	+	+	--	+
1,6	+	+	+	+	+	+	***	+
2,4	+	+	+	+	+	+	--	+
3,2	+	+	+	+	+	+	***	+
4,0	+	+	+	+	+	+	--	upon request
4,8	+	+	+	+	+	+	***	upon request
6,4	+	+	+	+	+	+	--	upon request
8,0	+	+	+	+	+	+	***	upon request

+ available, stock article, \*\*\* only pre configured as pieces of 15cm available

## Availability with 0.8 mm wall thickness

For P30 and MULTI-4, not suitable for LabDos P100, Vario and Easy-Load

Di/ mm	HPT-Silicon	HPT-PHARM	HPT-FuelOil	Tygon® Lab	HPT-Viton®	HPT-Ultra	coupling (2 pcs)
0,19				+			upon request
0,25		+		+		***	upon request
0,51		+	+	+	+		upon request
0,63	+			+			upon request
0,89	+	+		+	+		upon request
1,3	+	+		+			upon request
1,42	+	+	+	+	+		upon request
2,06	+	+	+	+	+		upon request
2,79	+	+	+	+	+		upon request

+ available, stock article, \*\*\* only pre configured as pieces of 15cm available

The coupling element for the transition from the pump hose to other hose material is made of PVDF.

All hoses are available as products sold by meter (except HPT-Ultra) or as pre configured 15 cm pieces per dozen.

## Analytcs hoses for P30 pump heads (stock artikles):

Order Code	Description
IP-P-HPT-PHARM-08-005-m	Hose Pharmed, inner diameter 0.51 mm, wall thickness 0.8 mm
IP-P-HPT-PHARM-08-009-m	Hose Pharmed, inner diameter 0.89 mm, wall thickness 0.8 mm
IP-P-HPT-PHARM-08-028-m	Hose Pharmed, inner diameter 2.79 mm, wall thickness 0.8 mm
IP-P-HPT-SILP-08-006-m	Hose Silikon (platinum), inner diameter 0.64 mm, wall thickness 0.8 mm
IP-P-HPT-SILP-08-013-m	Hose Silikon (platinum), inner diameter 1.3 mm, wall thickness 0.8 mm
IP-P-HPT-SILP-08-028-m	Hose Silikon (platinum), inner diameter 2.79 mm, wall thickness 0.8 mm
IP-P-HPT-PVC-08-003-m	Hose PVC, inner diameter . 0,25 mm, wall thickness 0,8 mm
IP-P-HPT-PVC-08-009-m	Hose PVC, inner diameter . 0,89 mm, wall thickness 0,8 mm
IP-P-HPT-PVC-08-028-m	Hose PVC, inner diameter . 2,75 mm, wall thickness 0,8 mm
IP-P-VITON-08-009-m	Hose Viton®, inner diameter 0.89 mm, wall thickness 0.8 mm
IP-P-VITON-08-014-m	Hose Viton®, inner diameter 1.42 mm, wall thickness 0.8 mm
IP-P-VITON-08-028-m	Hose Viton®, inner diameter 2.79 mm, wall thickness 0.8 mm
IP-P-HPT-FUELOIL-08-005-m	Hose fuels and oils, inner diameter 0.51 mm, wall thickness 0.8 mm
IP-P-HPT-FUELOIL-08-014-m	Hose fuels and oils, inner diameter 1.42 mm, wall thickness 0.8 mm
IP-P-HPT-FUELOIL-08-028-m	Hose fuels and oils, inner diameter 2.79 mm, wall thickness 0.8 mm

Hoses for other pumping heads can be found on the next page.

Order Code	Description
IP-P-HPT-SILP-16-008-x	Hose silicone (platinum), inner diameter 0.8 mm, wall thickness 1.6 mm
IP-P-HPT-SILP-16-016-x	Hose Silikon (platinum), inner diameter 1.6 mm, wall thickness 1.6 mm
IP-P-HPT-SILP-16-032-x	Hose Silikon (platinum), inner diameter 3.1 mm, wall thickness 1.6 mm
IP-P-HPT-SILP-16-048-x	Hose Silikon (platinum), inner diameter 4.8 mm, wall thickness 1.6 mm
IP-P-HPT-SILP-16-064-x	Hose Silikon (platinum), inner diameter 6.4 mm, wall thickness 1.6 mm
IP-P-HPT-SILP-16-080-x	Hose Silikon (platinum), inner diameter 7.9 mm, wall thickness 1.6 mm
IP-P-HPT-PVC-16-008-x	Hose PVC, inner diameter 0.8 mm, wall thickness 1.6 mm
IP-P-HPT-PVC-16-016-x	Hose PVC, inner diameter 1.6 mm, wall thickness 1.6 mm
IP-P-HPT-PVC-16-032-x	Hose PVC, inner diameter 3.1 mm, wall thickness 1.6 mm
IP-P-HPT-PVC-16-048-x	Hose PVC, inner diameter 4.8 mm, wall thickness 1.6 mm
IP-P-HPT-PVC-16-064-x	Hose PVC, inner diameter 6.4 mm, wall thickness 1.6 mm
IP-P-HPT-PVC-16-080-x	Hose PVC, inner diameter 7.9 mm, wall thickness 1.6 mm
IP-P-HPT-NEOPR-16-016-x	Hose Neopren, inner diameter 1.6 mm, wall thickness 1.6 mm
IP-P-HPT-NEOPR-16-032-x	Hose Neopren, inner diameter 3.1 mm, wall thickness 1.6 mm
IP-P-HPT-NEOPR-16-048-x	Hose Neopren, inner diameter 4.8 mm, wall thickness 1.6 mm
IP-P-HPT-NEOPR-16-064-x	Hose Neopren, inner diameter 6.4 mm, wall thickness 1.6 mm
IP-P-HPT-VITON-16-016-x	Hose Viton®, inner diameter 1.6 mm, wall thickness 1.6 mm
IP-P-HPT-VITON-16-032-x	Hose Viton®, inner diameter 3.1 mm, wall thickness 1.6 mm
IP-P-HPT-VITON-16-048-x	Hose Viton®, inner diameter 4.8 mm, wall thickness 1.6 mm
IP-P-HPT-VITON-16-064-x	Hose Viton®, inner diameter 6.4 mm, wall thickness 1.6 mm
IP-P-HPT-FUELOIL-16-016-x	Hose fuels and oils, inner diameter 1.6 mm, wall thickness 1.6 mm
IP-P-HPT-FUELOIL-16-032-x	Hose fuels and oils, inner diameter 3.1 mm, wall thickness 1.6 mm
IP-P-HPT-FUELOIL-16-048-x	Hose fuels and oils, inner diameter 4.8 mm, wall thickness 1.6 mm
IP-P-HPT-FUELOIL-16-064-x	Hose fuels and oils, inner diameter 6.4 mm, wall thickness 1.6 mm
IP-P-HPT-CHEM-16-016-x	Hose Chem (Tygon® chemical), inner diameter 1.6 mm, wall thickness 1.6 mm
IP-P-HPT-CHEM-16-032-x	Hose Chem (Tygon® chemical), inner diameter 3.1 mm, wall thickness 1.6 mm
IP-P-HPT-CHEM-16-048-x	Hose Chem (Tygon® chemical), inner diameter 4.8 mm, wall thickness 1.6 mm
IP-P-HPT-CHEM-16-064-x	Hose Chem (Tygon® chemical), inner diameter 6.4 mm, wall thickness 1.6 mm
IP-P-HPT-ULTRA-16-016-x	Hose High Performance, inner diameter 1.6 mm, wall thickness 1.6 mm
IP-P-HPT-ULTRA-16-032-x	Hose High Performance, inner diameter 3.1 mm, wall thickness 1.6 mm

-x: m = product sold by meter , k = 12 pcs 15 cm segments

Other hoses and couplings are available on request.

### Order information hose couplings (stock articles):



Order Code	Description
IP-P-FIT-I-PV-1/8	Hose coupling 1/8", PVDF
IP-P-FIT-I-PV-3/16	Hose coupling 3/16", PVDF
IP-P-FIT-I-PV-1/4	Hose coupling 1/4", PVDF
IP-P-FIT-I-PV-1/16	Hose coupling 1/16", PVDF
IP-P-FIT-I-PV-1/8	Hose coupling 1/8", PVDF
IP-P-FIT-I-PV-3/16	Hose coupling 3/16", PVDF
IP-P-FIT-I-PV-1/4	Hose coupling 1/4", PVDF
IP-P-FIT-R-PV-1/16-1/8	Hose coupling as reduction piece 1/16 auf 1/8", PVDF
IP-P-FIT-R-PV-3/16-1/8	Hose coupling as reduction piece 3/16 auf 1/8", PVDF
IP-P-FIT-R-PV-1/4-1/8	Hose coupling as reduction piece 1/4 auf 1/8", PVDF
IP-P-FIT-R-PV-3/8-1/4	Hose coupling as reduction piece 3/8 auf 1/4", PVDF

**Other hose couplings, T- and Y-couplings are available on request.**

## LabDos™ Gear Pumps

Annual gear pumps for the pulsation-free conveying and dosing within the control circuit of particle-free liquids of low to higher viscosity with medium flow.

Heating is possible.

### Special Characteristics:

- Low-Noise Run
- Valveless Design
- High Pressure
- Accurate and reliable
- Long Term Stability
- Extensive Operational Range
- Small Dead Volume

For operation at a LAB-PI, a RS232 interface is required.



### Pump Heads:

Type	Maximum Delivery Rate
280ML80B	280 ml/min
070ML30B	70 ml/min
018ML10B	18 ml/min

### Technical Data

Mode of Operation	Magnet-coupled Annual Gear Pump
Delivery Rate	0,05...280 ml/min / 0,012..70 ml/min / 0,03... 18 ml/min
Max. Pump Pressure	80 bar /30 bar / 10 bar
Media Connections	Di 4mm Da 6mm / Di 1/16" Da 8"/ Di 1/16" Da 1/8"
Speed	0 to 6000 Rev/min. Speed is load-independent.
System Pressure	100 bar
Dosing into Vacuum	No
Suction Height	Self-priming up to a low suction height depending on media.
Materials in Contact with Media	High Grade Steel 316L
Media Temperature	-5 ..60°C . Higher temperatures are available upon request.
Activation	RS232, optional 4..20mA
Operational Voltage/ Power	230V AC, 150W
Media Compatibility	Many chemicals. Please verify individual cases.
Protection Class	IP 30
EX Version	No. If required, please contact us.

Delivery Scope: Annual Gear Pump with RS232 Interface

Order Code	Description
IP-P-Z1-280ML80B-E	Gear Pump with 0,05...280 ml/min, Differential Pressure 80 bar, High Grade Steel 316L
IP-P-Z1-070ML30B-E	Gear Pump with 0,012..70 ml/min, Differential Pressure 30 bar, High Grade Steel 316L
IP-P-Z1-018ML10B-E	Gear Pump with 0,03...18 ml/min, Differential Pressure 10 bar, High Grade Steel 316L
IP-P-Z1-HEAT	Heating System for Annual Gear Pump Z1, Tmax = 60 °C
ZK-IT-HI01-BS-R2-I-03	RS232 Cable Sub-D9/Sub-D9, 3 m for connection to a LAB- or MSR-PI or PC
IP-P-LABDOS-RS485	RS485 Bus. Activation of up to 32 pumps via serial interface.

Further accessories can be found in the Chapter „ LabDos Peristaltic Pumps“.

## LabDos™ Piston Dosing Pump

Valveless positive displacement piston pumps enables the precise dosing and pumping of small quantities of aggressive, viscous and crystallising media within the medium pressure and temperature range.

The piston dosing pump LabDos-T is suited for varied dosing tasks even below the microlitre range (sub-microlitre).

### Particular Features:

- Valveless Design
- Chemically inert due to use of ceramic
- Precise and reliable
- Long term stability
- Great working range
- Only one moving part
- Reversible
- Small dead storage

The displaced volume and the stroke frequency can be independently adjusted. This leads to an enormous working range. The displaced volume can be adjusted in 1000 steps at the calibrating ring. The stroke frequency can be varied from 0,01 to 500 / min.



### Pump Heads:

Type	Max. Displaced Volume	Maximum Delivery Rate
T-2	0 - 5 µl	0 – 2,5 ml/min
T-12	0 - 25 µl	0 – 12,5 ml/min
T-25	0 - 50 µl	0 – 25 ml/min
T-50	0 -100 µl	0 – 50 ml/min

### Technical Data

Operating mode	Valveless positive displacement piston pump with adjustable drive
Max. flow rate	up to 3000 ml/h
Max. discharge pressure	6,9 bar
Dosing in vacuum	possible
Stroke frequency	up to 500/min
Max. Displaced Volume	5 – 100 µl
Suction Lift	Self-priming, dependent of media
Media affecting materials	PVDF/ceramic piston and bushing
Media connection	Hose/plastic tube inner /outer diameter = 4/6 mm
Media temperature	Max. 100 °C
Activation	serial connector RS232
Power supply	230 V AC
Media compatibility	Various chemicals, necessity to examine in individual cases
Protection Category	IP20
Ex-version	No

Delivery Scope: Piston dosing pump with RS232 interface.

Order Code	Description
IP-P-LABDOS-T-2	LabDos pump with piston pump head, 0 – 2,5 ml/min
IP-P-LABDOS-T-12	LabDos pump with piston pump head, 0 – 12,5 ml/min
IP-P-LABDOS-T-25	LabDos pump with piston pump head, 0 – 25 ml/min
IP-P-LABDOS-T-50	LabDos pump with piston pump head, 0 – 50 ml/min
IP-P-LABDOS-AE	Analogue interface /input rpm control (0-5 Volt and 4-20mA)
ZK-IT-HI01-BS-R2-I-03	RS232 Cable sub-D9/Sub-D9, 3 m, for connection to LAB- or MSR-PI or PC
IP-P-LABDOS-RS485	RS485 Bus, activation of up to 32 pumps via a serial interface

media connection:

SN4-6	Tube fitting I.D./OD 4/6mm
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On request deliverable:

- Other flow rates
- Other materials: high grade steel, carbon

## SyrDos™ Syringe Doser

The SyrDos syringe dosers are suited for the precise dosing of minute quantities and oxidation-sensitive materials (no air cushion!).

With the integrated 2/3-way valve, it is possible to realise a quasi continuous dosing by automatically refilling the syringe from a storage tank. The refilling period is approximately 6 sec. Optionally, the multi-way valve can be equipped with up to 12 ways.

The syringe doser, in combination with a AutoSam Sample Collector, can also be deployed to draw and bottle samples.

### SyrDos1

When using two pumps with the -CONT option it is possible to feed continuously. A special algorithm enable shock-free switchching.

For independet use the SyrDos2 is qualified.



SyrDos Syringe Doser with 2/3 -Way Valve

#### Technical Data

Operating mode	Syringe doser with step motor drive up to 10.000 steps/s
Max. flow rate	Depending on syringe 10/25/50/100/250/500 µl and 1/2,5/5/10/25/50ml in 2,5/4,9s
Max. discharge pressure	10 bar, depending on syringe, higher pressure (up to 28 bars) upon request
Dosing in vacuum	Possible up to 10 mbar (monitor steam pressure )
Resolution	24.000/48.000 steps
Suction lift	Self-priming, dependent of media
Media affecting materials	Glass, PTFE, Kel-F, optionally ceramics
Media connection	UNF 1/4" 28G
Media temperature	15 to 40°C
Activation	serial connector RS232 or RS485 (Bus for up to 15 pumps)
Power supply	230V AC, 65VA
Media compatibility	Various chemicals, require to be examined in individual cases
Protection class	IP 20
Dimensions (DxWxH)	70 x 255 x 160mm
Weight	10 kg
Ex-Version	No

Order Code	Description
IP-SYRDOS1-ss-V2/3	SyrDos Syringe Doser for 10µl to 50ml Syringe, RS232, 2/3-Way Valve
IP-SYRDOS1-ss-VDxx	SyrDos Syringe Doser for 10µl to 50ml syringe, RS232, multi-way distribution valve (distr)
IP-SYRDOS1-ss-VNDyy	Syringe Doser for 50ul to 50ml Syringes, RS232, Multi-Way Valve(non distribution)
IP-SYRDOS-VCER	Upcharge for 2/3-way oder multi-way valve in ceramic version
IP-SYRDOS-VHPR	Surcharge max. pressure 28 bar for 2/3 way or multi-way valve
IP-SYRDOS-SYRG-vol	Syringe for syringe doser, glass
IP-SYRDOS-SYRG-OPTBP	Syringe plunger made of black PTFE
IP-SYRDOS-VDxx	Replacement distribution valve (Distribution)
IP-SYRDOS-OPTHP04	Extended pressure range (max. 28 bar) for 4-way valve
ZK-IT-HI01-BS-R2-I-03	RS232 Cable sub-D9/Sub-D9, 3 m, for connection to LAB- or MSR-PI or PC

ss = resolution, steps 24 = 24.000, 48 = 48.000  
 xx = number of positoins 2 to 12; yy = Anzahl der Wege, 3 oder 4  
 vol = 10U, 25U, 50U, 100U, 250U, 500U, 1000U, 2500U, 5M, 10M, 25M, 50M accordingly 10/25/50/100/250/500 µL and 1/2/2,5/5/10/25/50 ml

#### Order example:

Syringe doser, resolution 48.000 steps, 12-way valve, media connection UNF 1/4-28, Activation RS232, with 3 m serial cable for connection to LAB or MSR-PI, 1 ml syringe.

Custom made versions for higher pressures and sepcial materials upon request.

Please request details information material.

Order Codes: IP-SYRDOS1-48-VD12 and IP-SYRDOS-SYRG-1000U

Other flowrates are available on request.

## SyrDos2 Syringe Doser

The SyrDos2 pump offers extended application options.

The integrated control panel with a LC-Display also enable the operation as independent pump.

It supports, in addition to the LabDos-compatible RS232 protocol, the standardised MODBus-RTU protocol. The power supply for the two pumps is integrated.

If two pumps are accordingly connected with the -CONT option, continuous conveying is also possible. Shock-free change-overs are reached with a special algorithm.

Due to the robust high grade steel casing, it is also suited for deployment in rough process conditions.



SyrDos2 Syringe Doser with 2/3-Way Valves

### Technical Data

Mode of Operation	Syringe Doser with step motor drive with up to 10.000 steps/s.
Max. Delivery Rate	Depending on syringe 10/25/50/100/250/500 µl and 1/2,5/5/10/25/50ml in 2,5/4,9s
Max. Pump Pressure	8 bar, depending on syringe, optionally 30 bar at max. 1 ml syringes
Dosing into Vacuum	Possible up to 10 mbar (consider the vapour pressure)
Resolution	24.000/48.000 Steps
Suction Height	Self-priming, media-dependent
Materials in Contact with Media	Glass, PTFE, Kel-F, optional Ceramic
Media Connections	UNF 1/4" 28G
Media Temperature	15 to 40°C
Activation	Serial Interface RS232 or RS485 (MODBus-RTU Protocol)
Operational Voltage	230V AC, 100VA
Media Compatibility	Many chemicals. Please verify individual cases.
Protection Class	IP 20
Dimensions (WxHxD)	223 x 270 x 180 mm
Weight	approx. 10 kg
EX Version	No

Order Code	Description
IP-SYRDOS2-ss-V2/3	SyrDos2 Syringe Doser for 50µl to 50ml Syringes, RS232, RS485, 2/3-Way Valve
IP-SYRDOS2-ss-VDxx	SyrDos2 Syringe Doser for 50µl to 50ml Syringes, RS232, RS485, mutliway-valve (distr)
IP-SYRDOS2-ss-VNDyy	Syringe Doser for 50µl to 50ml Syringes, RS232, RS485, mutliway-valve (non distribution)
IP-SYRDOS-VCER	Extra Charge for Ceramic Version for 2/3-Way or Multi-Way Valve (1 required per valve)
IP-SYRDOS-SYRG-vol	Syringe for Syringe Doser, Glass
IP-SYRDOS-CONT	SyrDos Extension for continuous conveying with two pumps
IP-SYRDOS-TCON-dd	T-piece for PTFE tube, inner diameter 0,8 or 1,6mm
IP-SYRDOS-CHCKVAL	Pair of nonreturn valves, moisted material: PEEK, Spring: gold-plated high grade steel
IP-SYRDOS-SYRG-OPTBP	Syringe plunger made of black PTFE
IP-SYRDOS-VDxx	Replacement distribution valve (Distribution)
IP-SYRDOS-OPTHP04	Extended pressure range (max. 28 bar) for 4-way valve
ZK-IT-HI01-BS-R2-I-03	RS232 Cable Sub-D9/Sub-D9, 3 m, for connection to LAB- or MSR-PI or PC

ss = resolution, steps<sub>24</sub> = 24.000, 48 = 48.000  
 xx = number of positioins 2 to 12; yy = Anzahl der Wege, 3 oder 4  
 vol = 10U, 25U, 50U, 100U, 250U, 500U, 1000U, 2500U, 5M, 10M, 25M, 50M accordingly 10/25/50/100/250/500 µL and 1/2/2,5/5/10/25/50 ml  
 dd = inner diameter 08: di=0,8mm, 16: di=1,6mm

Special Design for higher pressure. Special materials etc. are available upon request.  
 Please do not hesitate to request more detailed information, if required.

### Example Order:

Duplex-Syringe Doser, Resolution: 48.000 Steps, 12-Way-Distribution Valve, Media Connection UNF 1/4-28, Activation RS232, 3 m RS232 Cable for

connection to LAB- or MSR-PI, 1 ml Syringe.  
 Order Codes: IP-SYRDOS-48-VD12 and IP-SYRDOS-SYRG-1000U

## Diaphragm Doser with Step Motor Control



MembraneDoser and PTFE-Pump Head

This pump is particularly suited for the low-pulsation conveyance of aggressive fluids within the range 0,002 L/h - 48L/h at up to 18 bar

the membrane pump doser combines all features and functions of conventional dosing pumps and makes dosing so uncomplicated that you can take

### Dosing Heads

PP	Type DME PP
VA (high grade steel)	Type DME VA
VA (electrically heated)	Optional
PTFE	Type DME PTFE
PTFE / externally cooled	Optional
PTFE / externally heated	Optional
PTFE /electrically heated	Optional, with/without control for heating jackets

### Accessories

Pulsation Absorber PTFE	Optional
Pulsation AbsorberVA	Optional
Pressurised Valve PTFE	Optional
(Prel.) Filter PTFE	Optional
Connections PTFE	Optional in GL14B or GL18B
Connections high grade steel	Optional in Swagelok or Gyrolok
Heating/cooling f. pump head/feeding	Optional
Vacuum application	Optional

Order Code	Description
IP-P-SM1-VA -mc	Precision step motor dosing pump, VA pump head, RS232
IP-P-SM1-PP -mc	Precision step motor dosing pump, PP pump head, RS232
IP-P-SM1-PTFE -mc	Precision step motor dosing pump, PTFE pump head, RS232
ZK-IT-HI01-BS-R2-I-03	RS232 Cable sub-D9/Sub-D9, 3 m, for connection to LAB- or MSR-PI or PC

mc=Model Code:

Model Code	Dosing Rate	Max. Pressure
2-18	2,5 l/h	18 bar
8-10	7,5 l/h	10 bar
12-6	12 l/h	6 bar
48-3	48 l/h	2,6 bar

high precision for granted.

The main functional principle of the pump is based on the direct connection of motor and diaphragm over a slide crank gear transmission with a tooth belt transmission. With this method, in contrary to to conventional dosing pumps, the position and the speed of the diaphragm are controlled via an electronic system with a microprocessor throughout the whole pressure/suction cycle.

The stroke frequency and the duration of the pressure stroke are controlled via a microprocessor-controlled step motor according to the required dosing quantity. This drive is unique in this category and can only found here.

Alternatively, the diaphragm doser is available with PP / VA or PTFE dosing heads and / or heatable or cooled dosing units.

### Interfaces

4-20mA	yes
RS232	Optional with digital-analogue converter
External Pulse	yes
Internal Timer	yes
Fieldbus-Interface	yes
NAMUR-Interface	Optional

### Technical Data

Operating Mode	step motor- diaphragm dosing pump
Flow Rate	0,002 l/h bis 48 l/h
Adjustable Range Flow Rate	1:1000
Maximum Output Pressure	18 bar
Dosing in Vacuum	no
Suction Lift	5 m
Dosing Faults	± 1% of the set value
Max. Viscosity	500 mPas
In contact with Media	VA or PP or PTFE
Activation	serial connector RS232, 4-20 mA, 2-10 V, single stroke control
Power supply	100-230 V AC

### Order example:

Precision step motor dosing pump, 2,5 L/h, 18 bar, pump head PTFE,

Order code: IP-P-SM1-PTFE-2-18

## Pneumatic Dosing Pumps

Modotec® Dosing system; pneumatic dosing of liquids and gases.

Modular constructed dosing system consisting of a control unit and diaphragm dosing head with positively controlled diaphragm valves.

The pneumatic activation ensures that the pump heads are especially suited for the Ex-range.

### Module Control

- Autonomous Control Unit
- Externally controllable
- Direct control through PLS via Type C
- Power Supply 220V / 24 V
- Compressed Air 3 – 6 bar



Autonomous Control with integrated pneumatic Valve Terminal



Valve Terminal for Activation via LabBox/manager or SPS

### Module Dosing Head

- Compact Dosing Head
- Small Dimensions
- Version with low dead storage
- No mechanically moved parts
- Low wear, low-maintenance
- Corrosion-resistant materials
- Simple assembly and cleaning
- Option: Ex-version

### Special Features Dosing Head Type T

- Controllable Diaphragm Valves
- Position-independent installation
- Dosing directly into the vacuum
- Optional Ex-version

### Special Features Dosing Head Type S

- Ball Valves
- Twin Dosing Heads
- Optional Ex-version

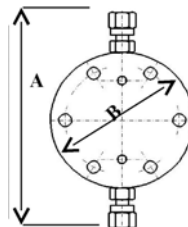
### Special Features Dosing Head Type P

- Dosing Head with additional controllable multi-function valves for automated sample drawing
- Multi-Component Dosing
- Multi-way Dosing Head
- Optional Ex-version

### Special Features Dosing Head Type V





- Conveyance out of the vacuum into the normal pressure range
- Controlled valves combined with ball valves

### Pump Heads Dimensions



	A	B	C	Process Connection	Pneumatic Connection
	mm	mm	Depth mm	mm	mm
Type 1T	78	38	45	1,6/3,2	4
Type 2T	88	48	55	3,2	4
Type 4T	109	69	55	3,2	4
Type 6T	160	120	75	6	4

## Pump Heads

	 Type T	 Type S	 Type P	 Type V
Pneumatic Pressure Supply	3 – 6 bar	3 – 6 bar	3 – 6 bar	3 – 6 bar
Process Pressure				
Suction Lift(mWs)	4	4	4	10 *)
Delivery Height (mWs)	50	50	50	50
Process Temperature (if necessary, heating module **)	< 100 °C	< 100 °C	< 100 °C	upon request
Max. Displaced Volume	40 µl	upon request	upon request	upon request
Head Size 1	500 µl	500 µl	250 µl	upon request
Head Size 2	1800 µl	1800 µl	900 µl	900 µl
Head Size 4	8000 µl	upon request	upon request	1500 µl
Head Size 6				
Max. Delivery Volume				
Head Size 1	100 ml/h	upon request	upon request	upon request
Head Size 2	1800 ml/h	2000 ml/h	250 µl	upon request
Head Size 4	4000 ml/h	8000 ml/h	900 µl	2000 ml/h
Head Size 6	8000 ml/h	upon request	upon request	6000 ml/h

\*) in flooded con

\*\*) Heating with Thermostat

### Technical Data

Operating mode	Piston dosing pump with pneumatic gear
Max. flow rate	see table
Dosing in vacuum	Models with pressure-keeping and closing valve
Stroke Frequency	0 - 180/min
Stroke length	variable 0 - 100%
Suction Lift	5 m Ws
Materials in contact with media	PTFE/carbon/ceramic
Media connection	Tube/Pipe ID/OD = 4/6 mm
Ambient temperature	-10 ... 45°C
Control Voltage	4 ... 20 mA
Power supply	230 V AC
Display	Strokes/min, after calibration l/h either
Media compatibility	Almost all chemicals
Protection Category	IP 65
Ex-version	No

Order Code	Description
IP-P-N1-PK-mc	Pump head pneumatic diaphragm dosing pump
IP-P-N1-PK-STRG-E	Autonomous control, pneumatic diaphragm dosing pump
IP-P-N1-PK-STRG-VI	Valve terminaldiaphragm dosing pump for binary activation

mc = Model Code: T,S,P,V

ec=electrical connection:

T	Tuchel connector LAB-PI
O	Open ends for MSR-PI

### Order example:

Pneumatic diaphragm dosing pump Type P, autonomous control:

Order Code: IP-P-N1-PK-mc und IP-P-N1-PK-STRG-E

## Magnetic dosing pump

Magnetic dosing pumps are driven by an electric magnet. These generate a short and forceful dosing stroke. The dosing rate is controlled via the stroke frequency. The dosing stroke can additionally be adjusted manually.

## Magnetic membrane dosing pump

Robust, calibratable membrane dosing pump with a magnetic drive for volumetric dosage or gravimetric dosage with a receiver on the balance in the control circuit.

### Technical data

Operating mode	Membrane dosing pump with magnetic gears
Max. flow rate	1,1 l/h
Max. discharge pressure	16 bar
Dosing in vacuum	Only with pressurised blocking valve
Stroke frequency	0 - 180/min
Stroke length	variable 0 - 100%
Suction height	5 m Ws
Material in contact with media	PTFE/carbon/ceramic
Media connection	Tube/pipe ID/OD = 4/6 mm
Ambient temperature	-10 to 45°C
Activation	4 to 20 mA
Power supply	230 V AC
Display	Strokes/min, after calibration also l/h
Media compatibility	Almost all chemicals
Protection class	IP 65
Ex-version	---



Order Code	Description
IP-P-M1-1100M-PTFE/C/KER-SN4/6-ea	Magnetic membrane dosing pump, 1.1 l/h, 16 bar self-priming, materials PTFE/carbon/ceramic, 180 strokes/min, Activation 4 - 20mA, with 1 x 1,5m cable for connection at a LAB- or MSR-PI (please indicate which one)

ea=electrical connection:

T	Tuchel connector LAB-PI
O	Open ends for MSR-PI

### Order example:

Magnetic membrane dosing pump, 1,1 l/h, 16 bar self-priming, Materials PTFE/Carbon/Ceramic, 180 strokes/min, Activation 4 - 20mA, with 1 x 1,5m Cable for connection with a LAB-PI.

Order Code: IP-P-M1-1100-PTFE/C/KER-SN4/6-T

On request deliverable:

- PP, acrylic glass, stainless steel 1.4571
- Dosing monitoring, self bleeding head for outgassing media
- Other flowrate

## Magnetic piston dosing pump

Robust, accurate piston dosing pump for liquids with a magnetic drive for precise, pressure-independent volumetric dosage. This pump is primarily suitable for precisely dosing small quantities.



### Technical Data

Operating mode	Piston dosing pump with magnetic gears
Flow rate	0,06 ... 150 ml/h
Max. discharge pressure	40 bar
Pressurised valve	2,5 bar
Dosing in vacuum	yes
Stroke frequency	0 - 50/min
Displace volume	1 - 50 µl, by micrometer button
Stroke length	variable 0 - 100%
Suction Lift	6 m Ws
Materials in contact with media	PTFE/ceramic or stainless steel 1.4571/ceramic
Media connection	Capillaries da =1,75 mm or 1/16" accords to 1,58 mm
Ambient temperature	5 to 45°C
Reproducibility	better ± 0,5%
Activation	4 - 20 mA
Power supply	230 V AC
Media compatibility	Almost all chemicals
Protection Category	IP 65
Ex-version	Possible, on request

Order Code	Description
IP-P-P1-0150M-PTFE/KER-SN17-ea	Magnetic piston dosing pump, 0,06 - 150 ml/h, 40 bar self-priming, materials PTFE/Ceramic, 0 - 50 strokes/min, activation 4 - 20mA, with 1 x 1,5m cable for connection at a LAB- or MSR-PI (please indicate which one)
IP-P-P1-0150M-VA/KER-SN16-ea	Magnetic piston dosing pump, 0,06 - 150 ml/h, 40 bar self-priming, materials 1.4571/ceramic, 0 - 50 strokes/min, activation 4 - 20mA, with 1 x 1,5m cable for connection at a LAB- or MSR-PI (please indicate which one)

ma=media connection:

SN17	Capillary screw connection OD = 1,75mm, only in PTFE
SN16	Capillary screw connection OD = 1/16" according 1,58mm, only in stainless steel

ea=electrical connection:

T	Tuchel connector LAB-PI
O	Open ends for MSR-PI

### Order example:

Magnetic piston dosing pump, 150 ml/h, 40 bar self-priming, materials stainless steel/ceramic, 0 - 50 strokes/min, activation 4 - 20mA, with 1 x 1,5m cable for connection with a LAB-PI.

Order Code: IP-P-K1-0150M-VA/KER-SN16-T

available on request:

- Ex-version
- Greater discharge flows

## Ex-Magnetic Membrane Dosing Pump

Explosion-proof, robust membrane dosing pumps with a magnetic drive for volumetric dosage, gravimetric dosage with a receiver on a balance in a control circuit .

The standard type, made of PTFE/carbon/ ceramic materials are particularly suitable for aqueous media with a certain electrical conductivity.

When using flammable media we recommend the stainless steel model.



### Technical Data

Operating mode	Membrane dosing pump with magnetic gears
Max. flow rate	1,0 l/h
Max. discharge pressure	16 bar
Dosing in vacuum	Only with pressurised blocking valve
Stroke frequency	0 - 120/min
Stroke length	variable 0 - 100%
Suction height	6 m Ws
Materials in contact with media	PTFE/carbon/ceramic
Media connection	Tube/Pipe 6 x 4 mm
Ambient temperature	-10 ... 45°C
Activation	4 - 20 mA, input inherently safe „ia“
Power supply	230 V AC
Media compatibility	Almost all chemicals
Protection Category	IP 65
Ex-version	EEx ia d IIC T6

Order Code	Description
IP-P-M2-1000M-PTFE/C/KER-SN4/6-ea	Ex-magnetic diaphragm dosing pump, 1,0 l/h, 16 bar self-priming, materials PTFE/carbon/ceramic, 120 strokes/min, activation 4 - 20mA, with 1 x 1,5m cable for connection at a LAB- or MSR-PI (please indicate which one)

ma=media connection:

SN4-6	Tube fitting I.D./OD 4/6mm
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ea=electrical connection:

T	Tuchel connector LAB-PI
O	Open ends for MSR-PI

### Order example:

Ex-Magnetic membrane dosing pump, 1,0 l/h, 16 bar self-priming, materials PTFE/carbon/ceramic, 120 strokes/min, activation 4 - 20mA, with 1 x 1,5m cable for connection at a LabManager.

Order Code: IP-P-M2-1000M-PTFE/C/KER-SN4/6-T

available on request:

### Materials:

- PP, acrylic glass, stainless steel 1.4571
- self-venting head for outgassing media
- Model for higher viscosity
- further discharge flows

Notice: When using flammable media, use electrical grounding at stainless steel models and metal conductors, because of electrostatic discharge.

## Precision Motor Membrane Dosing Pump

Accurate membrane dosing pumps with positively controlled valves are used for precise dosing of gases and liquids. They can also dose small quantities of aggressive, abrasive, and viscous media. The inlets can be thermostatically heated and cooled. Stroke frequency and displaced volumes can be controlled separately.

Due to the special construction (controlled cam valves, valve closing and opening during diaphragm standstill, through overlapping of the closing conditions no uncontrolled flow) this doser has an extremely high precision and repeat accuracy. It can convey into vacuum and convey out of vacuum.

Through the forced drive of the valves, a secure valve function and a high impermeability is also achieved. This makes the reliable dosing of gases possible.

The dosing of gases should take place without pressure. Principally, the dosing with other pressure ratios is also possible. But the pressure difference range is limited due to the densification ratio. The flow rates must be calculated by calibration runs.



### Technical Data

Operating mode	Motor diaphragm dosing pump with cam-controlled valves
Flow rate	0 - 1800 ml/h
Max. input compression	5 bar
Max. pressure difference	1 bar
Dosing in vacuum	Yes, till 0,001 mbar abs.
Stroke frequency	0 - 60/min
Displace volume	10 - 500 µl
Suction Lift	Self-priming, till 30 mbar abs. primary pressure
Materials in contact with media	Post-compressed PTFE
Media connection	PTFE, tube/plastic pipe I.D./OD = 4/6mm
Media temperature	up to 100 °C
Activation	serial connector RS232, 4-20 mA, 2-10 V, single stroke control
Power supply	230 V AC
Power consumption	70 W
Media compatibility	Almost all chemicals
Ex-version	upon request

Order Code	Description
IP-P-M3-1800M-PTFE-SN4/6	Precision motor diaphragm dosing pump, 36 - 1800 ml/h, 1 bar, materials PTFE, 0 - 60 strokes/min, activation RS232
ZK-P-TL02-BS-R2-I-01	RS232 Cable Sub-D9/Sub-D9, 3 m, for connection to LAB- or MSR-PI or PC

ma=media connection:

SN4-6	Tube fitting I.D./OD 4/6mm
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### Order example:

Precision motor diaphragm dosing pump, 36 - 1800 ml/h, 1 bar, materials PTFE, 0 - 60 strokes/min, activation RS232, with 3m serial cable for connection at a LabBox or LabManager.

Order Code: IP-P-M2-1800M-PTFE-SN4/6 and ZK-P-HZ01-BS-R2-I-01

available on request:

- Other flowrates
- Heating and cooling of the pump head and feed lines
- Vacuum applications

## High Pressure Double Piston Dosing Pump

The high pressure double piston pump is made out of resistant materials and has a pulsations free flow. It is suited for dosing under high pressure in high pressure reactor systems and micro-reactor systems.



### Technical Data

Operating mode	Motor double piston pump for high pressure
Max. flow rate	6 - 599,4 ml/h
Max. discharge pressure	500 bar
Dosing in vacuum	possible
Materials in contact with media	Stainless steel 1.4571, Aluminum oxide ceramic, carbon reinforced PTFE
Media connection	Capillary OD = 1/16" equivalent 1,58mm
Activation	0-10 V DC, 2 x digital, RS232
Power supply	230 V AC
Media compatibility	Almost all chemicals, besides chlorine-containing materials, hydrochloric acids
Ex-version	--

Order Code	Description
IP-P-P3-0600M-VA/KER-SN16-ea	High pressure double piston dosing pump, 6 - 599,4 ml/h, 500 bar, materials 1.4571/ceramic, activation 0 - 10V DC, 2 digital outputs with 3 x 1,5m cable for connection at a LAB- or MSR-PI, RS232

ma=media connection:

SN16	Screw connection for capillary 1/16" (1,58mm)
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ea=electrical connection:

T	Tuchel connector LAB-PI
O	Open ends for MSR-PI

### Order example:

High pressure double piston dosing pump, 6 - 599, 4 ml/h, 500 bar, materials 1.4571/ceramic, activation 0 - 10V DC, 2 digital outputs with 3 x 1,5m cable with Tuchel plugs for connection to a LabManager

Order Code : IP-P-K3-0600M-VA/KER-SN16-T

available on request:

- Increased discharge pressure up to 800 bar
- Flow rates from 10 to 1000ml/min
- Other packing materials

## Eccentric screw pump

Self-priming, pulsation free motor dosing pump for dosing and conveying for:

- Media with different viscosities up to the pasty range
- Suspensions, for instance sauces
- abrasive suspensions, for instance soldering paste, polishing paste
- Polymer, high viscous and crystal-containing pre-products, for example: lacquer, glue and melts
- Viscous materials and granulated suspensions of the foods and pharmaceutical industry

The pump is easy to disassemble and to clean.

It is well suitable for speed regulated operations at a frequency converter.

Normally for connection at a LAB-PI an analogue output (LP-AAP8 or LP-AEAP), an passive digital output (LP-DAP8) for releasing and a digital input (LP-DEP8x) for the fault report are needed.



### Technical Data

Operating mode	Eccentric screw pump with rotary current motor
Flow rate	0 ... 24 l/h, depending on viscosity
Max. discharge pressure	12 bar
Dosing in vacuum	upon request
Speed	0 ... 1000 rpm, depending on viscosity
Metered volume per rev.	0,40 ml
Suction height	Self-priming, media dependent
Materials in contact with media	Stainless steel 1.4571 hard chrome plated /perfluor rubber/PTFE
Viscosity	1 ... 2.000.000 mPas
Media connection	Suction sided G ½", pressure sided Rp ¼", equivalent transitions available on request
Media temperature	up to 200 °C
Metered accuracy	Normally <math>\pm 1\%</math>
Control	Frequency converter
Power Input	0,25 kW
Power supply	230 V AC
Media compatibility	Most chemicals beside chlorine-containing materials, hydrochloric acids
Protection class	IP 54
Ex-version	possible

Order Code	Description
IP-P-E1-2700M-VA/FKM-ea	Eccentric spiral pump with rotary current – asynchronous motor 0,25KW and frequency converter, 0-14 l/h, 12 bar, materials 1.4571 hard-chromium plated/fluorine rubber/PTFE, 0-1000 rpm, with cables to connect to a PI

ea=electrical connection:

T	Tuchel connector LAB-PI
O	Open ends for MSR-PI

### Order example:

Eccentric spiral pump with rotary current asynchronous motor 0,25KW und frequency converter, 0 - 24 l/h, 12 bar, materials 1.4571 hard chrome plated/fluorine rubber/PTFE, 0-1000 rpm, with cable for connection at a LabManager

Order Code: IP-P-E1-2700M-VA/FKM-T

available on request:

- Other flowrate
- Adjustable revolution gear

Other materials:

- Hastelloy
- Pump head heating

## Toothed Ring Pumps

Toothed ring pumps are suitable for pulsation poor conveyance and dosing of particle-free and not lubricating fluids of lower to high viscosity at low flow rates. They distinguish themselves by small dead storage and high dynamics.

Applications:

- Small quantity dosage
- Analysis technology
- Biotechnology
- Medical technology

## Low pressure pump

Low pressure pumps distinguish themselves by a small construction volume and a favorable price. It makes pulsation free and highly precise conveying of small quantities, also not lubricating media possible.



### Technical Data

Operating mode	Directly coupled toothed ring pump
Flow rate	0,15 - 9 ml/min and 0,3 - 18 ml/min continuous
Pulsation	1.5% and 6%
Revolution	100 to 6000 rpm, DC motor, revolution load independent
Max. discharge pressure	0 ... 3 bar
Viscosity	0.5 ... 20mPas
Dosing in vacuum	conditional
Suction Lift	Self-priming up to low lift, media dependent
Materials in contact with media	Hard metal (tungsten carbide), nickel bronze, PTFE
Media connection	Tube nipple OD = 2 mm
Media temperature	5 ... 50°C
Activation	0-10V, (4-20mA, RS232 opt.)
Revolution feedback	0-10V, (4-20mA, RS232 opt.)
Power supply / Performance	230 V AC, 50 W
Media compatibility	Watery solutions, solvents, low viscous oil and lubricants
Ex-version	---

Order Code	Description
IP-P-R1-9M-HM-SN2-ea	Micro toothed ring pump with controllable DC motor, 0.15 - 9 ml/min, max. pressure difference 3 bar, materials: hard metal/nickel bronze/PTFE, with cable for connection at a HiTec Zang-PI
IP-P-R1-18M-HM-SN2-ea	Micro tooth ring pumps with controllable DC motor, 0.3 - 18 ml/min, max. pressure difference 3 bar, materials hard metal/nickel bronze/PTFE, with cable for connection at a HiTec Zang-PI

ea=electrical connection:

T	Tuchel connector LAB-PI
O	Open ends for MSR-PI

**Order example:**

Toothed ring pumps with controllable DC motor, 0.15 - 9 ml/min, Max. pressure difference 3 bar, materials hard metal/nickel bronze/PTFE, cable with Tuchel connectors for connection at a LabManager.

**Order Code: IP-P-R1-9M-HM-SN2-T**

## High Performance Pump

This high performance toothed ring pump distinguishes itself by good suction behaviour, less dead volumes, less pulsation and a very large viscosity range, and high dynamics.



### Technical Data

Operating mode	Direct coupled toothed ring pump
Pulsation	6%
Revolution	100 up to 6000 R/min, DC motor, Revolution load independent
Viscosity	0.5 ... 50.000 mPas
Dosing in vacuum	conditional
Suction Lift	Self-priming, media dependent
Material in contact with media	hard metal (tungsten-carbide), stainless steel 316L, PTFE
Media connection	Screw fitting for 6/4mm plastic tube
Media temperature	0 bis 50 °C (-126 bis -140°C upon request)
Activation	0-10V, (4-20mA, RS232 opt.)
Revolution feedback	0-10V, (4-20mA, RS232 opt.)
Power supply / Leistung	230V AC, 50W
Media compatibility	Media compatibility Watery solutions, solvent, low viscous oil and lubricants
Ex-version	--

For a safe operation a particle filter is required.

Order Code	Description
IP-P-R2-18M-HM-SF1/8-ea	High performance pump 0,003 - 18 ml/min, Delta-p max. 30 bar, max. 50.000 mPas
IP-P-R2-72M-HM-SF1/8-ea	High performance pump 0,012 - 72 ml/min, Delta-p max. 50 bar, max. 50.000 mPas
IP-P-R2-288M-HM-SF1/8-ea	High performance pump 0,048 - 288 ml/min, Delta-p max. 40 bar, max. 1.000.000 mPas
IP-P-R2-10152M-HM-SF1/8-ea	High performance pump 0,192 - 1.152 ml/min, Delta-p max. 60 bar, max. 150.000 mPas

ea=electrical connection:

T	Tuchel connector LAB-PI
O	Open ends for MSR-PI

### Order example:

Toothed ring pump with controllable DC motor, 0,3 - 18 ml/min, max. pressure difference 30 bar, materials hard metal/stainless steel/PTFE, cable with Tuchel connectors for connection at a LabManager.

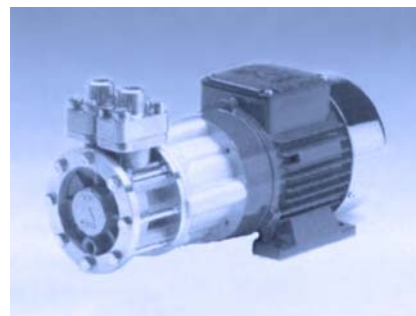
**Order Code: IP-P-R2-18M-HM-SF1/8-T**

## Centrifugal Pumps

### Centrifugal Pump for High Pressure

This magnet coupled centrifugal pump without shaft seal is particularly suitable for recirculation of heat carriers up to 350°C. The conveying of chemicals with higher temperature is also possible within the range of stability. It is also possible to provide systems and control valves with high flow resistances. Due to the complete separation of the media and drive, this pump is also very robust at extreme application conditions.

Particularly in multi reactor and parallel reactor systems with a joint thermostat control in mixing operations (large temperature changing rates, emergency cooling at exothermically reactions) the thermostat installed in the pump is often not sufficient. In this case, our pump is an appropriate solution.



#### Technical Data

Operating mode	Small magnet coupled centrifugal pump
Delivery Rate	water 840 l/h at 3 bar
Max. flow rate	1800 l/h
Max. pressure difference	5 bar
Revolution	2800 rpm
max. System pressure	25 bar
Suction Lift	No, influent
Materials in contact with media	Stainless steel 1.4408, 1.4571, 1.4581
Media connection	Internal thread G 1/2"
Media temperature	Up to 350 °C heat transfer oil, aqueous media up to 200°C possible
Activation	Over switching sockets (LP-DA230V2) or (HP-B230V8A)
Power supply	230V AC 1 Ph, 0,5 kW. 400V AC 3 Ph possible
Media compatibility	Many chemicals, no chlorine-containing materials and hydrochloric acids.
Protection Category	IP 54
Ex-version	Possible, upon request

Order Code	Description
IP-B-K1-1800L-VA-GMG1/2-ep	Centrifugal pump, 0,5 kW, 2800 rpm at 50 Hz, up to 1800 l/h max. pressure difference 5 bar, system pressure max. 25 bar, material stainless steel

ep=Mains Power connection:

230V	230V AC 1 Ph
400V	400V AC 3 Ph

Accessories for electrical connection of the pump like switching sockets (HP-B230V8A), protection etc. upon request.

#### Order example:

Centrifugal pump with three-phase asynchronous motor 0,5 kW, 230V AC, 2800 rpm at 50 Hz, up to 1800 l/h Max. pressure difference 5 bar, system pressure max. 25 bar, material: stainless steel.

Order Code: IP-B-K1-1800L-VA-GMG1/2-400V

We can offer you a complete spectrum of similar pumps for similar applications. Please contact us!

available on request:

- Other rotor material: PEEK
- Controllable model with frequency converter
- Model complete with frequency converter and difference pressure measuring for difference pressure control
- Model with IDM measuring orifice plate for mass flow control

## Centrifugal Pump for Chemicals

Magnet coupled chemical centrifugal pump without shaft seal for conveying and recirculation of pure and aggressive chemicals like acids, bases and solvents....

Typical applications:

- Extraction
- Distillation in pilot plant, mini plant
- Recirculation of baths: galvanic industry, photo industry...

Usually, a digital output (LP-DAP8...) is required for start and stop at a LAB-PI. In individual cases a revolution controller (e.g. pressure difference controller) can be useful. In this case, an analogue output (LP-AAP8UI or LP-AEAP8I) for activation of a frequency converter will be needed.

If needed, please additionally order the frequency converter.



### Technical Data

Operating mode	Small magnet coupled centrifugal pump for chemical engineering
Delivery Rate	Water: 3000 l/h at 0,4 bar
Max. flow rate	3900 l/h
Max. pressure difference	0,78 bar (7,8m discharge height, water)
Revolution	2800 rpm
max. Density	1300 kg/m <sup>3</sup>
Suction Lift	No, influent
Material in contact with media	CFRETFE (Carbon fiber PE/PTFE-compound), silica carbide, FKM
Media connection	External screw thread 1"
Media temperature	Up to 80°C
Activation	Over switching sockets (LP-DA230V2) or (HP-B230V8A)
Power supply / Performance	230V AC 1 Ph, 170W. three-phase current possible.
Media compatibility	Media compatibility. Most chemicals, acids and bases.
Ex-version	Possible, upon request. Please inquire when using not conductive, flammable liquids because of the static charge.

Order Code	Description
IP-B-K2-3900L-ETFE/SIC	Chemical centrifugal pump with alternating current motor 170W, 230V AC, up to 3900 l/h Max. pressure difference max. 0,78 bar, materials CFRETFE/SiC/FKM

We can offer you a complete spectrum of similar pumps for further applications. Please inquire.

available on request:

- Other flowrates and pressure difference
- Other materials: PP...

## Reaction Proportioning Pumps

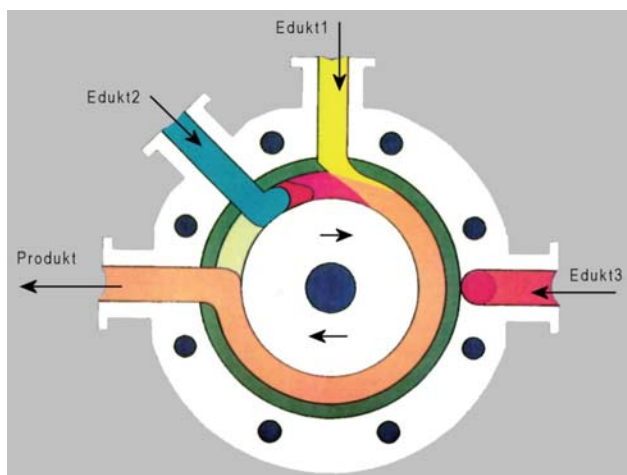


Reaction proportioning pumps are especially suited for the production of nanoparticles and to test the reaction conditions for mixing or mass transfer tasks.

The pumps dispose of peripheral wheel- typical pressure cells. In these, the liquid educt is compressed and flushed over the mixing rotor due to the generated turbulences. The subsequently generated circulation flows lead to especially homogenous and stable mixtures.

Depending on the material, the mixers are chemically highly resistant and are able to handle system pressures up to 350 bar and temperatures of up to 450 °C.

Reaction proportioning pumps are basically peripheral wheel pumps with several inlet nozzles for the fluid and gas feed.



There is a separate inlet opening for each component in the diameter wall of the mixing chamber, the flow section of which is especially constructed according to the viscosity of the fluid, the projected mixing ratio or the expected reaction. A gaseous component can be fed into the mixing chamber between the inlet opening of the liquid component and the outlet/discharge opening of the mixture.

### Characteristics:

- Robust and Safe
- Simple Test Equipment
- Safe test conditions, e.g. for phosgene transformation
- Total volume is continuously regulable
- Represents an alternative to stirred reactors or micro-mixers
- Especially homogenous and stable mixtures due to intensive mixing

In order to ensure a high chemical stability, the reaction mixers are constructed in Hastelloy, Tantal or silicon carbide for the part in contact with the products as well as with PTFE or Perfluorelastomer gaskets. Plastic linings with antistatic PTFE or PFA are also deployed. The drive of the mixer is magnet-coupled. In case of toxic or corrosive substances, it is possible to deploy double separating cans.

The wear due to solid material content in the fluid, e.g. due to precipitation during a reaction, is countered with a suited selection of materials and design of the wheel, separating can and the shaft bearing. The separating can and the bearing, if necessary, can be flushed with a suited liquid.

Depending on the respective reaction conditions, the chemical objectives, or the process-related basic conditions, special equipment is available for the reaction mixers.

If exothermal o endothermal reactions are to be expected, the pumps can be equipped with heated or cooled pump heads. It is, for instance, subsequently possible to run a reaction isothermally or to prevent a melt from sulphuring. For this purpose, pump heads with a heating chamber or with a heatable separating can are available.

When producing nanoparticles, the peripheral conveying system ensures fast mixing and a short holding time. As the nanoparticles are specifically produced in the reaction chamber, there is no increased risk of blockage or wear for the bearing or separating can.

Due to the dosing pumps and the speed regulation, there is a high variance of possible test parameters.

Order Code	Description
IP-B-REAKT1-4P	Reaction Proportioning Pump, three inlets, one outlet, three phase motor
IP-B-REAKT1-FU	Frequency Converter for Reaction Proportioning Pump

## Multi-Channel Dosing Systems

Flexible gravimetric dosing systems can be realised by combining the accordingly suited components.

Here are just a few of the possible combinations:

- Four-fold Dosing System with GraviDos**  
 LabBox1 with GraviDos weighing card and 4 magnetic valves or PFM-controlled pumps, HiBuilder custom software for dosing profiles and simple records and protocolling.

**Options:**

Special cable for the connection of the dosing pumps to 4..20mA digital outputs (PWM), further RS232 interfaces for connection of dosing pumps.

- Four-fold Dosing System with Laboratory Scales:**  
 LabBox1 with 4 RS232 interfaces for laboratory scales and 8 digital outputs for connection of the magnetic valves or PFM-controlled pumps, HiBuilder custom software for dosing profiles and simple records and protocolling.

- Four-fold Dosing System with Notebook acting as Control Unit:**  
 Notebook, USB to RS232 Converter, four-fold DMS-Card RS232, 4 GraviDos modules, 4 LabDos with RS232-Bus, HiBuilder custom software for dosing profiles and simple records and protocolling.

- Mehrfachdosiersystem mit SyrDos Spritzendosierer**  
 Notebook, USB an RS232 Converter, LabBox1, 2 SyrDos Systeme, DosiMaster Spezialsoftware für Dosierprofile und einfache Aufzeichnung u. Protokollierung.

**Options:**

Special cable for the connection of the dosing pumps to 4..20mA digital output (PWM), further RS232 interfaces for connection of LabDos and other dosing pumps.



Custom Design, mobile 4-fold Dosing Station



Kundenspezifisch gefertigte SyrDos-Dosierstationen

## Vacuum pumps

### Membrane vacuum pump

Dry running vacuum pump for neutral, highly aggressive and corrosives gases and vapours.

Applications:

- Evacuate in a raw vacuum range with or without cryo trap
- Rotary evaporator
- Evacuation of dehydrator
- Substitute of water jet pumps
- Discharge of process gases

For the connection at a LAB-PI a digital output (LP-DAP8) and a switching sockets (HP-B230V8A) or a digital output 230V (LP-DA230V2) are needed.



#### Technical Data

Operating mode	Two phase membrane vacuum pump for the chemistry
Suction capacity	1200 l/h
Final vacuum	8 mbar abs.
Media affecting materials	PTFE/FFKM
Media connection	Tube nipple for vacuum tube I.D. = 6mm, OD = 10mm
Activation	Over switching sockets (LP-DA230V2) or (HP-B230V8A)
Power supply / Leistung	230V AC 1 Ph, 120W
Current consumption	0,7A
Media compatibility	Almost all chemicals, gases and vapours
Ex-version	---

Order Code	Description
IP-B-V1-1200L-PTFE/FPM	Chemical vacuum pump with alternating current motor 120W, 230V AC, 1200 l/h, final vacuum 8 mbar, materials PTFE/FFKM

On request deliverable:

- Other flowrate
- Final vacuum 2 ... 100 mbar

## Two phase rotary valve vacuum pump

Two phase oil sealed rotary valve membrane pump for generating fine vacuum.

Applications:

- Evacuating of small up to middle reactor systems up to the higher fine vacuum range
- Lyophilization / freeze drying
- Vacuum distillation



By condensing aggressive media a cryo trap shall be provided.

For the connection at a LAB-PI a digital output (LP-DAP8) and a switching sockets (HP-B230V8A) or a digital output 230V (LP-DA230V2) are needed.

### Technical Data

Operating mode	Two phase oil sealed rotary valve vacuum pump
Suction capacity	5600 l/h
End partial pressure or gas ballast	$4 \times 10^{-4}$ mbar abs.
End total pressure or. Gas ballast	$2 \times 10^{-3}$ mbar abs.
End partial pressure with gas ballast	$6 \times 10^{-3}$ mbar abs.
Media connection	Tube nipple for vacuum tube I.D. = 6mm or clamped flange DN 10
Activation	Over switching sockets (LP-DA230V2) or (HP-B230V8A)
Power supply / Performance	230V AC 1 Ph, 0,30kW
Media compatibility	Neutral gases, low quantities condensing and corroding vapors, apply cryo trap
Ex-version	---

Order Code	Description
IP-B-V2-5600L-SN6	Two phase rotary vacuum pump with alternating current motor 0,30kW, 230V AC, 5600 l/h, final vacuum $2 \times 10^{-3}$ mbar abs.

On request deliverable:

- Other flowrate
- One-level version
- Hybrid pump with better compatibility for aggressive vapors

## Vacuum Pump Stand

These laboratory vacuum systems are equipped with a controller. The control of the pressure is distinguished by a connection, respectively disconnection of the diaphragm pump. It is possible to suppress the connection of the pump motor a selective setting of the pressure rise rate or through an active Teach-Function. This means, that the system will only activate if a potential load is connected.

### Advantages

- equipped with a vacuum controller, chemical resistant diaphragm pump with control
- Vacuum control through revolution control
- Consistent operational readiness
- reduced operational costs
- increased service life and longer maintenance intervals of the diaphragm pump
- simple programming of the controller, directly or via PC
- Storage of all program and measurement values possible

Laboratory vacuum systems offer you an automatic cost-effective operation without additional charge. You do not need to supervise the operation of the pump. The integrated intelligent vacuum controller economically controls the revolutions of the pump. A suction-side separator ensures the protection of the vacuum pump by retaining particles and liquid droplets.

### Technical Data

Operating mode	Chemical-resistant diaphragm pump, separator
Suction capacity	2,2 / 4,9 / 9,1 m <sup>3</sup> /h
Final Pressure or gas ballast	< 2 mbar
Media connection	DN16KF-1/4 inch / DN16KF-1/4 inch / DN25KF-1/4 Zoll
Activation	RS232
Power supply	230V AC
Media compatibility	Neutral gases, small quantities of condensing and corroding vapors
Ex-version	No

For the connection to a LAB-PI, a RS232 cable is required.

Order Code	Description
IP-B-VPS-mc	Vacuum pump stand with chemical-resistant diaphragm pump and separator
ZK-P-VB01-BS-R2-I-01	Rs232 cable for IP-B-VPS-mc

mc=Model Code:

Model Code	Final vacuum	Suction capacity
2-2.2	< 2 mbar	2,2 m <sup>3</sup> /h
2-4.0	< 2 mbar	4,9 m <sup>3</sup> /h
2-9.1	< 2 mbar	9,1 m <sup>3</sup> /h

Other delivery rates and final pressures are available on request.



The pressure-side emission condenser ensures non-polluting operation by regaining and collecting solvent remains.

All components in contact with gas are made of top quality, chemically resistant materials. This even enables the evacuation of acids and solvent vapours. All glass parts are coated with a transparent shatter protection coating which preserves visibility of the processes. The coolers are insulated.

## Solid Matter Dosing System

### Load Lock Conveying System for Powders, Granulates, Crystals...



The SoliDos solid matter dosing system is suitable for the dosing of powdery and granular solid matters. For the laboratory technician, the manual adding of solid educts at specific times, or the adjustment of the pH-value through solid matter addition are a time-consuming matter.

With SoliDos You can now automate these operation steps. SoliDos is also suitable at best for the automatic seeding procedure of crystallization processes.

Thanks to its especially slim design, SoliDos ideally fits into the reactor installation.

For assembly, the SoliDos is directly mounted on to a NS 29/32 standard grinding socket. The dosing matter, also during the running operation, can be refilled manually or automatically through the lateral refill-socket by a mounted storage container. A rinsing/flushing connection for inert gas is provided between the lock chamber and the socket.

#### Advantages

- Resistant to most chemicals
- Suitable for powder and granular material-dosing
- Large range for the dosing rate
- Novel mechanics prevents fusing and dome formation
- Minimum floor space required, very simple installation
- Can be completely dismantled for cleaning
- Combination with GraviDos gravimetric dosing is possible

#### Fields of application

- Dosing of solid matter
- pH-adjustment with solid matter
- Seeding of crystallization processes

SoliDos can be run through a specific control device or directly through a PFM (pulse frequency module) modulated digital output of the LabManager.

SoliDos can also be run through an optionally available, separate control device.

The dosing rate can be adjusted via the rotation speed and the volume of the lock chamber.

Optionally, a nitrogen flushing connection and a side refilling nozzle can be provided.

SoliDos is built out of resistant materials. The standard model is made of borosilicate glass, stainless steel, and POM. Alternatively the material PTFE is available.



#### Technical Data

Diameter:	approx. 70 mm
Length:	approx. 330 mm
Connection:	NS29/32
Weight approx.	1300 g
Dosage amount max.	200 ccm

## Versions

Version (SoliDos2 - x)	-12	-25	-50	-100	-200	-400
Dosing rate approx. [ccm/min]	12	25	50	100	200	400
Dosed amount (per pulse) approx. [ccm]	0,12	0,25	0,50	1	2	4

Max. dosing amount: 200 ccm, unlimited by refilling through the side nozzle

Delivery Scope	Doser with 1,5 m connection cable for active digital output of a LabManager or-box-PI, respectively Stand-Alone-control unit
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Order Code	Description
IL-SOLIDOS2-x	Solid dosing basis device for LAB-PI
IL-SOLIDOS2-x-ST	Solid dosing basis device for stand-alone device
IL-SOLIDOS2-SK-x	SoliDos dosage valve
IL-SOLIDOS2-HEIZ	Electrical heating element for heating of the socket to prevent condensation
IL-SOLIDOS2-KF	Cold trap to prevent condensation in socket, NS29/32

x=version according to table-12 to -400

## SoliDos™ Options

An inert gas is pressed through the drive casing via the inerting connection on the drive casing in order to protect the drive from aggressive gases and to keep the dosing matter dry.

The SoliDos is available as vacuum and pressure-resistant (-1000 up to 300 mbar) version.

Special designs are available on request.

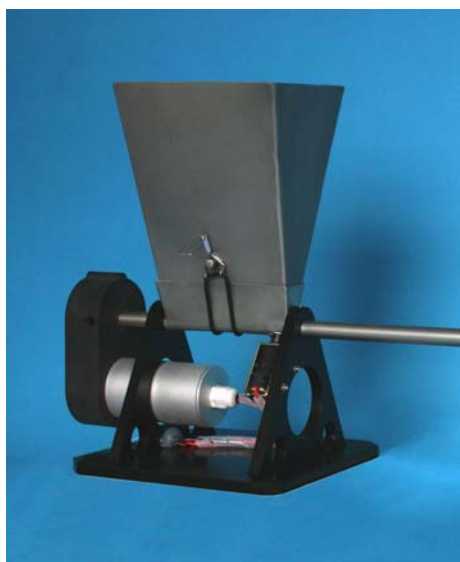
Order Code	Description
IL-SOLIDOS1IN	Inerting Connection for SoliDos solid doser on the drive

Adapter for GraviDos for gravimetric dosing.

Order Code	Description
IL-SOLIDOSADGD	SoliDos/GraviDos adapter for gravimetric dosing

Special designs and adapters for reactor nozzles are available on request.

## Screw Conveyor



The SoliDos-s conveys powdery and granulate-like solids out of a storage container. A knocking mechanism prevents possible stowage in the screw.

The devices are available as client-specific custom designs in various sizes. The length of the screw, in Size 1, can be up to 500 mm.

### Technical Data

Volumen	500 ml
Dimensions without Screw	300x300x400 mm
max. Length of Screw	500 mm
Diameter of Screw	10 mm
Weight approx.	2000 g
Max. Dosing Rate	1 ccm/min

Other dosing rates available on request.

Required as PI-interfaces are:

2 digital outputs

Content of delivery	Doser with 1,5 m connection cable for active digital outputs of a LabManager or -box-PI.
---------------------	--

Order Code	Description
IL-SOLIDOS-SF-V-1	SoliDos screw conveyor 500ml, volumetric

## Gravimetric Solid Doser



The SoliDos-s screw conveyor can be completed as gravimetric dosing unit. In the course of this, the weight reduction is registered by a precision scales.

### Technical Data

Volume	500 ml
Dimensions	300x300x400 mm
max. Length of Screw:	500 mm
Diameter of Screw:	10 mm
Weight approx.	3500 g
Max. Dosing Rate approx.	1 ccm/min
Max. Dosing Fault	±10 mg

Required as PI-interfaces are:

2 digital outputs and one RS232 interface for the scales.

Other dosing rates available on request.

Delivery Scope	Doser with 1,5 m connection cable for active digital outputs of a LabManager or -box-PI.
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Order Code	Description
IL-SoliDos-SF-G-1	Gravimetric solid doser with SoliDos screw conveyor Size 1

## Gravimetric frictional filler



The SoliDos-td frictional filler is suitable for precise dosing of solid matters.

### Technical data

Volume	1500 ml
Dimension	Höhe: 600mm Durchmesser: 180 mm
Materials	metallfreie Ausführung in PP, optional Edelstahl- ausführung
Weight (approx.)	4500 g
Max. dosing rate	220 ccm/min
Max. dosing rate	5 ccm/min

As PI-interfaces are needed:

Digital output (DAP8T) at the Lab/MSR-PI or GraviDos dosing control.

Other dosing rates upon request.

We also construct custom made systems.

Delivery Scope	Doser with 1,5 m connection cable for active digital outputs of a LabManager or -box-PI.
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Order Code	Description
IL-SOLIDOS-TD-V-1	frictional filler 1, volumetric
IL-SOLIDOS-TD-G-1	frictional filler 1, gravimetric
IL-SOLIDOS-TD-G	SoliDos control device for standalone operation (combinable with IL-SOLIDOS-TD-G-1)

## SoliDos™ - Control Device for Stand-Alone Operation



The SoliDos control device offers the best functionality for the operation of the SoliDos solid doser.

The device can both be controlled via the keypad and the serial (optional) or analogue interface. As it disposes of 5 dosing modes, this compact device can also be deployed everywhere without automation system.

### Dosing mode

The SoliDos supports five Dosing modes, that can be selected from the parameter menu. The setpoint values can either be entered manually via the keypad or analogue determined via the analogue interface or serially via the RS232 interface.

### rp : pulse rate

In the mode rp, a pulserate is predetermined. As soon as the SoliDos is started, it doses with the set pulse rate.e.g. 1 dosing stroke.

### rw: weight rate

In the mode rw, a weight rate in g is predetermined. The weight rate operation mode requires a calibration run.

### sp: pulse sum

In the mode sp, a pulse sum is predetermined. As soon as the SoliDos is started, it doses with the adjusted pulse rate until the adjusted pulse number is reached.

### sw: weight sum

In the mode sw, a weight sum in g is predetermined. Exactly like in the mode rw, a calibration run of the appliance is necessary. As soon as the SoliDos is started, it commences dosing with the preset weight rate until the set weight sum is reached.

### p: single pulse

In the mode p, the SoliDos can be driven in single step operation. If the UP button is actuated, a single dosing stroke will be triggered.

Delivery Scope	Control device and manual.
Order Code	Description
IL-SOLIDOSST1	SoliDos control device for standalone operation (combinable with IL-SOLIDOS2-X-ST)
IL-SOLIDOS-RS	Option RS232 interface
ZK-IT-HI01-BS-R2-I-03	RS232 Cable sub-D9/Sub-D9, 3 m, for connection to LAB- or MSR-PI or PC