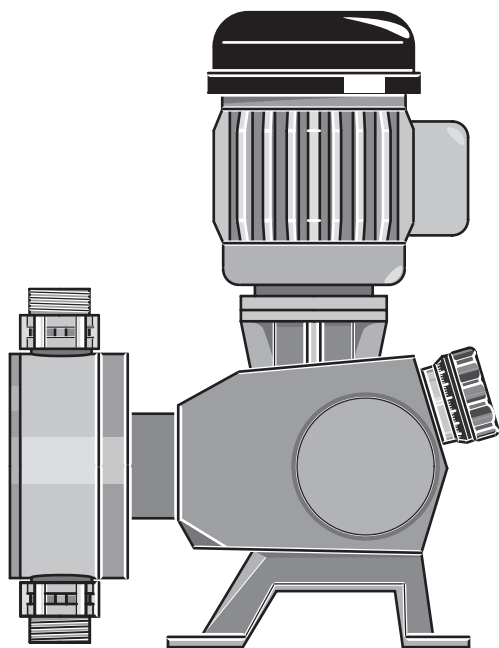


Operating Instructions

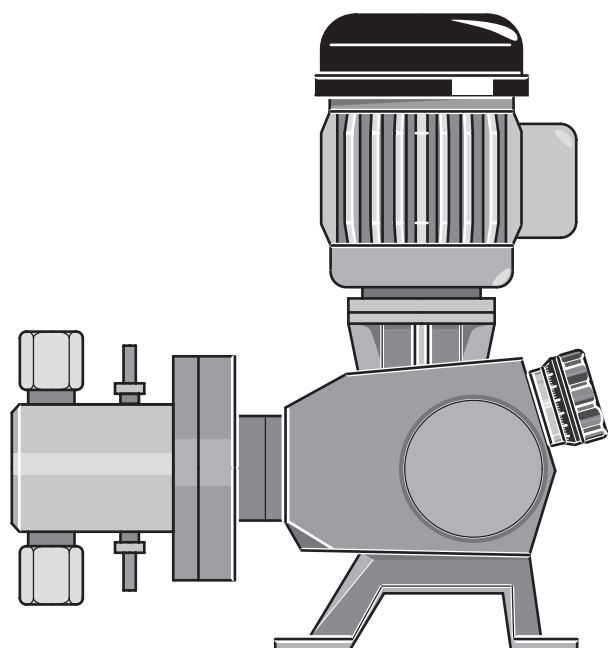
ProMinent® Meta

MTMa (Diaphragm Dosing Pumps)

MTKa (Piston Dosing Pumps)



MTMa



MTKa

Please affix device label here!

For safe and correct operation of ProMinent® Meta dosing pumps, two sets of Operating Instructions are required:
 The product-specific Meta Operating Instructions and ProMinent® motor-driven dosing pump Operating Instructions
 must be read together!

**Please read the Operating Instructions through completely before commissioning this equipment. Do not discard!
 Any part which has been subject to misuse is excluded from the warranty!**

Publishing details:
Operating Instructions ProMinent® Meta
© ProMinent Dosiertechnik GmbH

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Subject to technical modifications
Printed in the F.R. Germany

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Product Identification/Identity Code

The device label on the title page is identical to that supplied with the pump in order to facilitate matching the correct operating instructions manual to the pump.

Please enter the identity code given on the device label into the grey boxes below.

| MTMa | | | | | | | | | | | |
|---------------------------------------|--|--|--------|---|--|---|--|--|--|--|--|
| Meta Diaphragm Dosing Pump, Version a | | | | | | | | | | | |
| H A | | Main pump Add-on pump | | | | | | | | | |
| | | 03441 | 10130 | NEW: (6 mm stroke) | | Pump type: (figures 1 + 2 = back pressure [bar], figures 3 - 5 = feed rate [l/h]) | | | | | |
| | | 03530 | 10173 | 10200 | | | | | | | |
| | | 04353 | 10216 | 10263 | | | | | | | |
| | | 05265 | 10260 | 10330 | | | | | | | |
| | | 05440 | 12065* | 09395 | | | | | | | |
| | | 05530 | 12086* | 04400 | | | | | | | |
| | | 06260 | 12108* | 04527 | | | | | | | |
| | | 07216 | 12130* | 03662 | | | | | | | |
| | | 09173 | | 03790 | | * PC, PP and TT, max. 10 bar | | | | | |
| | | PC PP SS TT | | Liquid end materials: PVC Polypropylene Stainless steel 1.4571 PTFE + 25 % carbon | | | | | | | |
| | | A E T | | Seal material: Viton®/A EPDM PTFE Viton® is a registered trademark of DuPont Dow Elastomers. | | | | | | | |
| | | T | | Displacement component: Standard diaphragm, PTFE version | | | | | | | |
| | | 0 1 | | Liquid end version: No valve springs With 2 valve springs, Hastelloy C, 0.1. bar | | | | | | | |
| | | 0 1 2 3 4 5 6 7 8 | | Hydraulic connection: Standard according to technical data Union nut and PVC insert Union nut and PP insert Union nut and PVDF insert Union nut and stainless steel insert Union nut and PVC hose sleeve Union nut and PP hose sleeve Union nut and PTFE hose sleeve Union nut and stainless steel hose sleeve | | | | | | | |
| | | 0 1 | | Version: With ProMinent label (standard) Without ProMinent label (standard) | | | | | | | |
| | | S M N L P R Z 0 1 2 3 4 | | Electrical power supply: 3 ph. 230 V/400 V 50/60 Hz, 0.18 kW 1 ph. AC, 230 V/50/60 Hz, 0.18 kW 1 ph. AC 115 V 60 Hz, 0.25 kW 3 ph. 230 V/400 V, 50Hz, (EExe, EExde) 3 ph. 230 V/400 V, 60Hz, (EExe, EExde) 3 ph. variable speed motor, 230 V/400 V 1 ph. variable speed 230 V, 50/60 Hz Add-on pump (no motor) No motor, with flange 93/63 No motor, with flange 140/71 No motor, with flange 160/71 No motor, with flange 56 C | | | | | | | |
| | | 0 1 2 | | Motor safety ratings: IP 55 (standard) Exe version (EExe II T4) Exde version (EExde IIC T4) | | | | | | | |
| | | 0 1 | | Stroke sensor: No stroke sensor (standard) With stroke sensor, Namur signal (Ex) | | | | | | | |
| | | 0 1 2 A B C D | | Stroke length adjustment: Manual (standard) With stroke positioning motor, 230 V/50/60 Hz With stroke positioning motor, 115 V/50/60 Hz With stroke control motor 0...20 mA 230V/50/60Hz With stroke control motor 4...20 mA 230V/50/60 Hz With stroke control motor 0...20 mA 115V/50/60 Hz With stroke control motor 4...20 mA 115V/50/60 Hz | | | | | | | |
| MTMa | | | | | | | | | | | |

Product Identification/Identity Code

The device label on the title page is identical to that supplied with the pump in order to facilitate matching the correct operating instructions manual to the pump.

Please enter the identity code given on the device label into the grey boxes below.

| | | | | | | | |
|-------------|---|--------------|--|--|--|--|--|
| MTKa | Meta Piston Dosing Pump, Version a | | | | | | |
| | H | Main motor | | | | | |
| | A | Add-on motor | | | | | |
| | | 02749 | 06025 | 11313 | Pump type: (figures 1 - 3 = back pressure [bar], figures 4 + 5 = feed rate [l/h]) | | |
| | | 03241 | 06122 | 12910 | | | |
| | | 04033 | 07617 | 16208 | | | |
| | | 05126 | 09926 | 21012 | | | |
| | | 05249 | 10213 | 21606 | | | |
| | | 05425 | 10222 | 21610 | | | |
| | | 05441 | 10617 | 22508 | | | |
| | | 05633 | 10812 | 24006 | | | |
| | | SS | Liquid end materials: Stainless steel 1.4571 | | | | |
| | | T | Seal material: PTFE | | | | |
| | | S | Displacement component: Standard piston, oxide ceramic | | | | |
| | | | 0 | Liquid end version: No valve springs | | | |
| | | | 1 | With 2 valve springs, Hastelloy C, 0.1. bar | | | |
| | | | 0 | Hydraulic connection: Standard according to technical data | | | |
| | | | | 0 | Version: With ProMinent label (standard) | | |
| | | | | 1 | Without ProMinent label (standard) | | |
| | | | | S | Electrical power supply: 3 ph. 230 V/400 V, 50/60 Hz (WBS) | | |
| | | | | M | 1 ph. AC, 230 V, 50/60 Hz | | |
| | | | | N | 1 ph. AC 115 V, 60 Hz | | |
| | | | | L | 3 ph. 230 V/400 V, 50 Hz, (EExe, EExde) | | |
| | | | | P | 3 ph.230 V/400 V, 60 Hz, (EExe, EExde) | | |
| | | | | R | 3 ph. variable speed motor, 230 V/400 V | | |
| | | | | Z | 1 ph. variable speed, 230 V, 50/60 Hz cpl. | | |
| | | | | 0 | Add-on pump (no motor) | | |
| | | | | 1 | No motor, with flange 90/63 | | |
| | | | | 2 | No motor, with flange 140/71 | | |
| | | | | 3 | No motor, with flange 160/71 | | |
| | | | | 4 | No motor, with flange 56 C | | |
| | | | | | Motor safety ratings: | | |
| | | | | 0 | IP 55 (standard) | | |
| | | | | 1 | Exe version (EExe II T4) | | |
| | | | | 2 | Exde version (EExde IIC T4) | | |
| | | | | | Stroke sensor: | | |
| | | | | 0 | No stroke sensor (standard) | | |
| | | | | 1 | With stroke sensor, Namur signal (Ex) | | |
| | | | | | Stroke length adjustment: | | |
| | | | | 0 | Manual (standard) | | |
| | | | | 1 | With stroke positioning, 230 V/50/60 Hz | | |
| | | | | 2 | With stroke positioning, 115 V/50/60 Hz | | |
| | | | | A | With stroke control motor 0...20 mA 230 V/50/60 Hz | | |
| | | | | B | With stroke control motor 4...20 mA 230 V/50/60 Hz | | |
| | | | | C | With stroke control motor 0...20 mA 115 V/50/60 Hz | | |
| | | | | D | With stroke control motor 4...20 mA 115 V/50/60 Hz | | |
| MTKa | | | | | | | |

1. Safety Information for ProMinent® Dosing Pumps

Safety information and important operating instructions are divided into different categories and are indicated by pictograms. Please make yourself familiar with the following descriptions and pictograms:

**DANGER:**

Ignoring safety information can endanger life or result in serious injury!

**CAUTION:**

Ignoring safety information can result in injury to persons or damage to machinery or other materials!

WARNING:

These situations require special monitoring.

NOTICE:

Special guidelines

1.1 General Guidelines

**CAUTION:**

- *The equipment described here may only be used in accordance with the instructions for use given in this manual.*
- *Combining ProMinent® metering pumps with parts not approved and tested by ProMinent® is not permissible. It can cause injury or damage to persons or materials for which we cannot accept liability!*
- *Pumps should be accessible at all times for operation and maintenance purposes. Access must not be locked or blocked!*
- *Always empty liquid end and rinse out prior to carrying out maintenance and repair work if dangerous or unknown substances have been used!*
Observe the safety data sheets for chemicals!
- *When using with dangerous or unknown chemicals always wear protective clothing when working on the liquid end (safety glasses, gloves)!*

1.2 Instructions for Installation, Commissioning and Operation

**CAUTION:**

- *The dosing pump liquid end may still contain liquid from the factory inspections!*
- *All water should be removed from liquid end prior to use with chemicals which may not come into contact with water! For this purpose, rotate the pump 180 ° and empty the liquid end, then flush via the suction connector with appropriate materials.*
- *Do not connect signal cable to mains power!*
- *If the pump is operated against a closed stop tap the back pressure may increase to the maximum permissible back pressure. This can cause rupturing of the injection tubing!*
- *A bypass valve is recommended in order to prevent back pressure reaching maximum limit.*

WARNING:

- *Ensure that injection tubing is installed so that peak pressures produced by a dosing stroke do not exceed the maximum operating pressure (if necessary install bypass valve)!*
- *Stroke length adjustment should only be carried out when the pump is running!*
- *When commissioning the Meta dosing pump, withdraw the red gear bleed knob.*
- *A dry run is required when commissioning piston dosing pumps.*

NOTICE:

- *The pump must be firmly fixed in a position which will preclude danger of vibration! The liquid end valves must always be vertical to ensure smooth operation!*
- *The connection of suction and injection tubing to the liquid end must ensure that neither is subject to mechanical stress! Tubing must not be subject to vibration.*
- *Always use correct clamping rings and nozzles for tubing diameter, and original tubing with correct diameter and wall strength, otherwise guarantee is no longer valid. Do not reduce tubing sizes!*
- *When metering extremely aggressive or dangerous chemicals, it is advantageous to incorporate bleed valve feeding back into chemical storage container! Otherwise install a stop valve into suction or injection sides.*

1.3 Guidelines for Maintenance, Repair and Disposal**CAUTION:**

- *Dosing pumps and peripherals must be serviced by qualified or authorised personnel!*
- *Always empty liquid end and flush out prior to carrying out servicing and repair work if dangerous or unknown substances have been used! Read the chemical safety data sheets!*
- *When metering dangerous or unknown chemicals always wear protective clothing when working on the liquid end (safety glasses, gloves)!*
- *Always release pressure from injection tubing before working on pump!
Always empty and flush out liquid end!
Always read chemical safety data sheets!*

**DANGER:**

- *Always disconnect pump from mains power or remove tubing before opening up!
If relay option present, remove in all cases!
Check there is no power connected!
Ensure that pump cannot be switched on by unauthorised personnel while repair work is being carried out!*
- *Spring under strain. When disposing note: When dismantling the pump, note that the return spring ((5), section 2.2.1) is under strong mechanical strain.*
- *Do not discard pumps which have been used with radioactive materials!*

NOTICE:

Flush out liquid end and clean pumps thoroughly prior to returning to factory for repair work!

2. Meta Product Description**CAUTION:****Correct use**

*This pump is designed for use with liquid chemicals within the prescribed capacities!
Observe general precautions regarding viscosity limits, chemical resistance and seals.
All other uses or modifications are forbidden.*

Incorrect use

The pump is not designed for use with gaseous chemicals or solids. For chemical dosing, note material resistance. See chemical resistance list No. 2264-4!

The pump is not designed for use with flammable liquids!

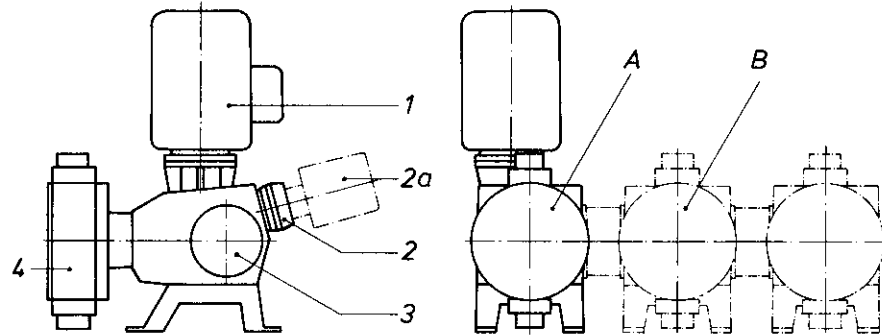
The pumps with piston liquid end are not suitable for metering liquids which cause danger of death.

2.1 Product Identification / Identification of Pump Type

As well as the standard technical data, the device label includes the identity code and the serial number. These two numbers should be quoted with all correspondence, as they enable clear identification of the pump type.

2.2 Design / Function Description

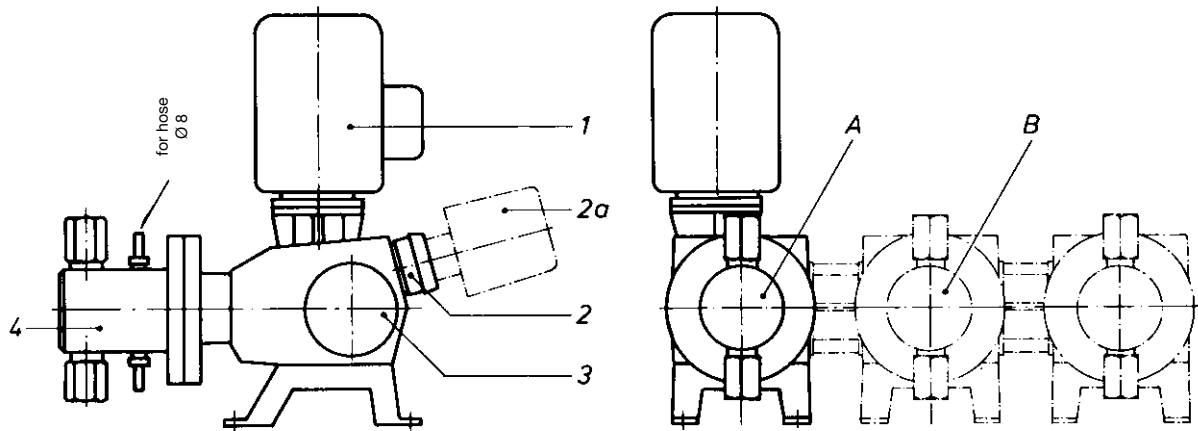
Side and End Views of MTMa Diaphragm Dosing Pump



1178/4

- | | |
|---------------------------------|--------------------------------------|
| 1 Motor | A Main pump MTMaH type |
| 2 Stroke length adjustment knob | B Externally mounted pump MTMaA type |
| 2a Stroke positioning motor | |
| 3 Gear box | |
| 4 Liquid end | |

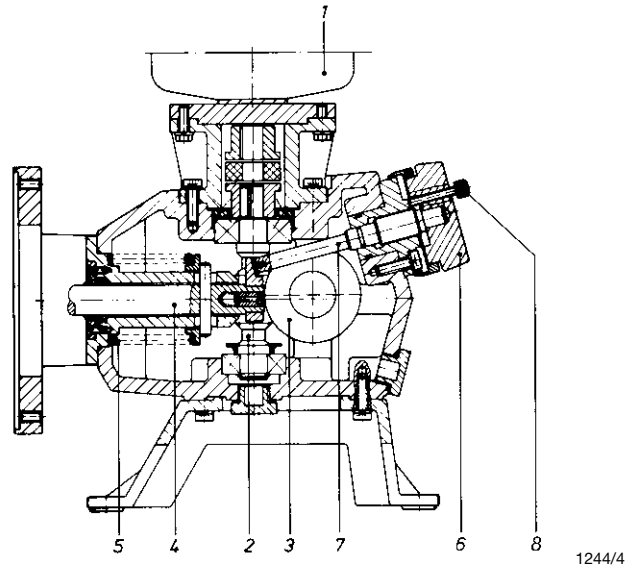
Side and End Views of MTKa Diaphragm Dosing Pump



1236/4

- | | |
|---------------------------------|--------------------------------------|
| 1 Motor | A Main pump MTKaH type |
| 2 Stroke length adjustment knob | B Externally mounted pump MTKaA type |
| 2a Stroke positioning motor | |
| 3 Gear box | |
| 4 Liquid end | |

2.2.1 Drive Function Description



The ProMinent® Meta pump is an oscillating diaphragm/piston dosing pump with continuously adjustable stroke length. It is driven by an electric motor (1). The drive rotation is produced by a worm gear pair (2) and transferred via the cam (3) to the push rod (4) thus producing an oscillating action. A powerful return spring (5) forces the push rod against the cam to produce the reciprocal stroke. The stroke length adjustment is carried out by the adjustment knob (6) and axis shaft (7) by limiting the reciprocal stroke.

For Meta dosing pumps with 6 mm stroke length an additional locking screw on the stroke length adjustment knob grip is required in order to set the selected stroke length (8).

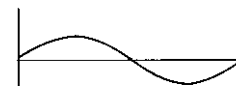
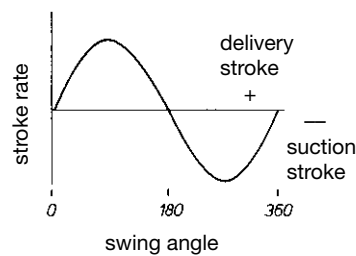
The stroke action is transferred via union nuts and bolts to the diaphragm/piston. These operate with the valves to increase/decrease the pressure in the liquid end, which causes the pump action. The pump flow is pulsed.

The drive motor (1) in the standard version is a 230/400 V. 50/60 Hz dual wound three-phase motor. It can also be supplied as a variable speed motor for adjustment of the feed rate by adjusting the stroke rate (manual or automatic). Manual stroke length adjustment can be changed to automatic adjustment of the feed rate by stroke length adjustment by the addition of a stroke positioning motor.

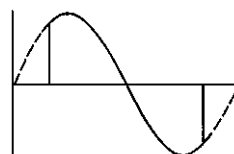
2.2.2 Diagram of Stroke Action

a) Stroke progress at max. stroke rate and stroke length

b) At reduced stroke rate (speed control)



c) At reduced stroke rate (speed control)

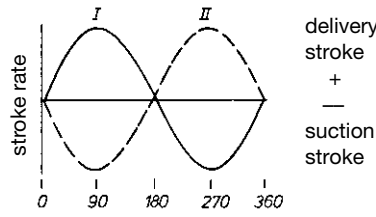


1179/4

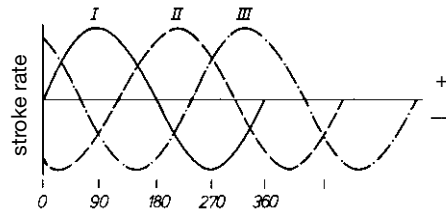
By adding an externally mounted pump the feed rate from the same motor can be doubled. The externally mounted pumps have no reduction gearing. They are connected to the cam shaft via cams set at 180° (for duplex) and 120° (triplexed). Suction and injection strokes overlap and the dosing flow is correspondingly smoothed.

Stroke rate at 100 % stroke length

Duplex pump



Triplex pump

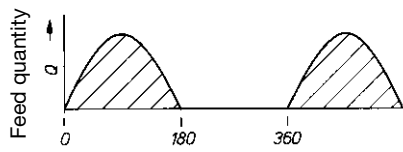


swing angle

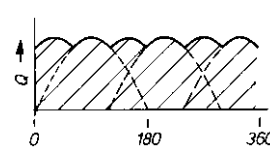
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Theoretical pump activity at 100 % stroke length

Simplex pump

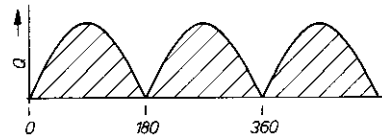


Triplex pump



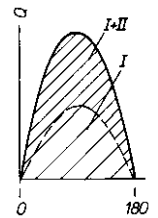
The actual dosing flow is affected by various factors, i.e. diaphragm elasticity, valve slippage, length and elasticity of tubing and back pressure at the end of the injection tubing.

Duplex pump



1181/4

In special cases, e.g. simultaneous dosing in mixing systems, the pumps can be linked together so that dosing strokes overlap. The tubing cross section must be correspondingly adapted for the altered dosing flow.

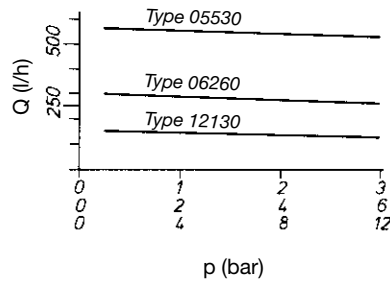


1181/4

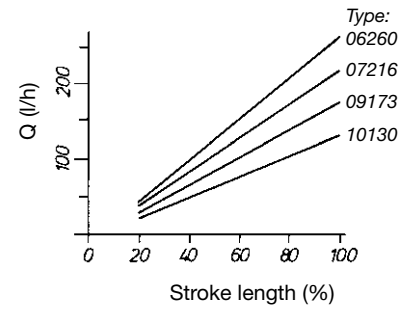
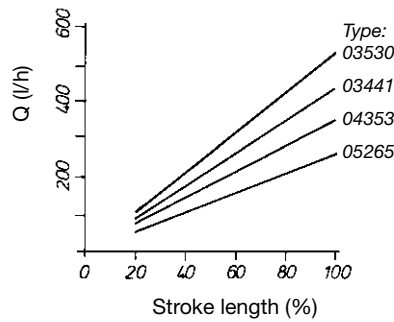
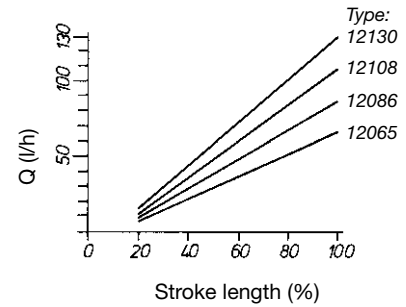
2.2.3 Feed Rate Diagrams

Meta diaphragm dosing pumps

Feed rate /
back pressure relationship



Feed rate /
stroke length relationship

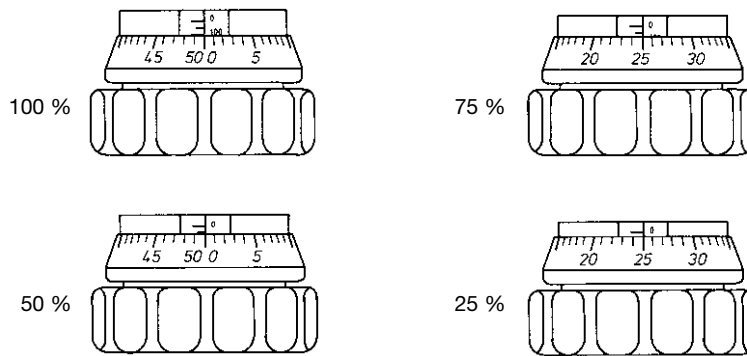


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NOTICE:

Similar linear characteristics of other pumps are available on request.

Stroke length adjustment – diaphragm dosing pumps



1600/4

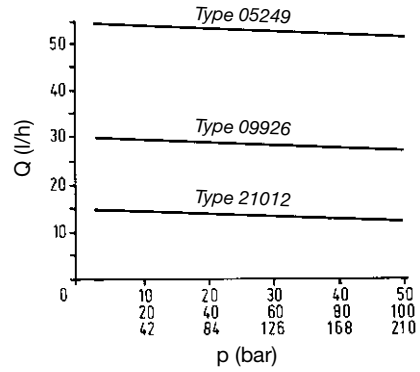
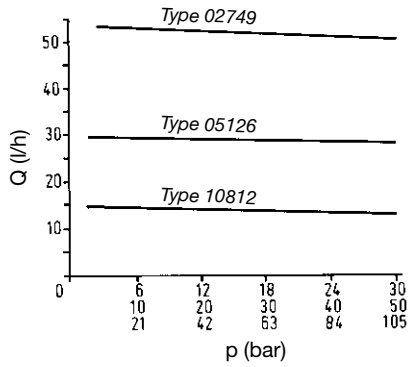
1 Turn (360 °) $\hat{=}$ approx. 50 % stroke length

NOTICE:

For Meta dosing pumps with 6 mm stroke length an additional locking screw on the stroke length adjustment knob grip is required in order to set the selected stroke length.

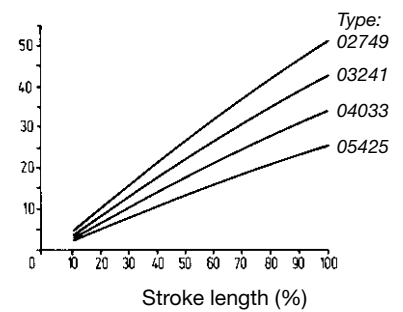
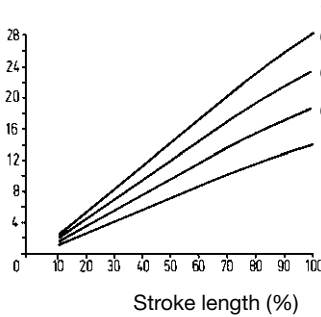
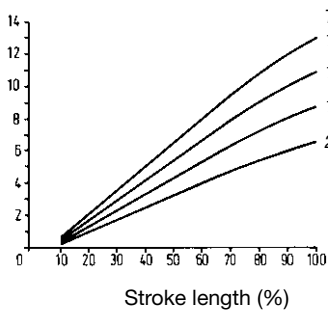
Meta Piston Dosing pump

Feed rate /
back pressure relationship



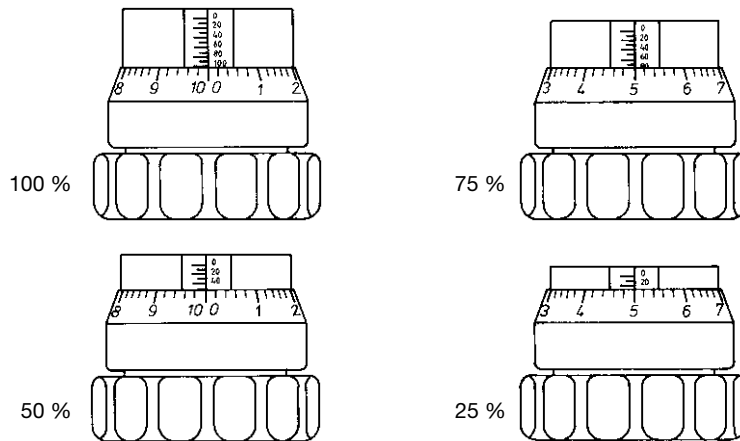
1245/4

Feed rate /
back pressure relationship



1246/4

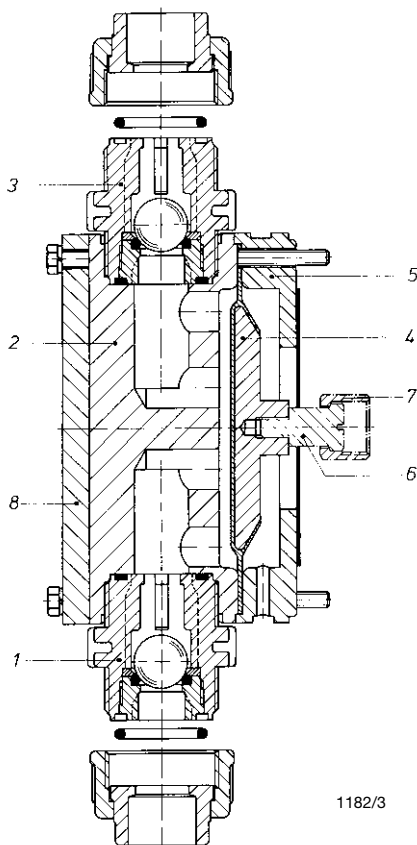
Stroke length adjustment – piston dosing pumps



1599/4

1 Turn (360 °) Δ approx. 10 % stroke length

2.2.4 Diaphragm Liquid End (FM) Function Description



1182/3

The heart of the liquid end is the Developan® dosing diaphragm (4). It hermetically seals the pump area inside the liquid end (2) which results in the pressure building up in the liquid end (2). The head disc (5) made from chemically resistant plastic, separates the drive housing from the feed section and protects the housing from corrosion in case of diaphragm rupture. The suction valve (1) and the identical injection valve (3) work together with the diaphragm action to produce the pump action. For dosing of viscous substances valve balls can be spring loaded. The connector dimensions of valves and liquid ends are the same, but they are made in different materials. These parts can be exchanged if necessary.

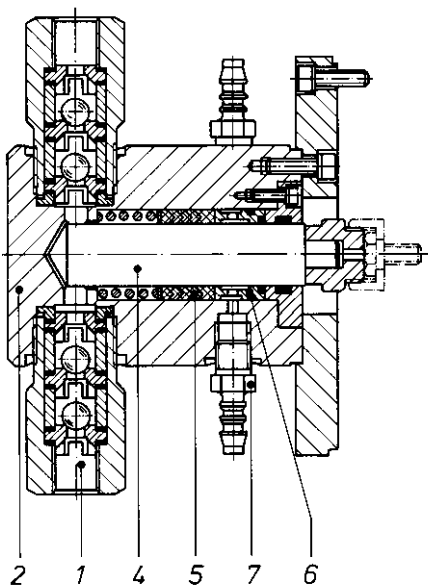
Diaphragm assembly

1. Screw coupling bolt (6) with nut (7) into the diaphragm (4) (left-hand thread!)
2. Screw together head disc (5) diaphragm (4) liquid end (2) and protective disc (8). Screw into housing by hand, do not tighten.
3. Tighten coupling nut (7)
4. While motor is running at 100 % stroke length, tighten alternate screws on liquid end (crosswise).

Choosing the Right Pump

The chemical resistance list can be used to help you to select the correct material combination for your application. The drive selection depends upon the application. For viscous chemicals we recommend that you install lower speed types.

2.2.5 Piston Liquid End (FK) Function Description



1193/4

The ProMinent® Meta HK uses a precise, chemical and friction resistant oxide ceramic piston (4) The piston seal is a pre-tensioned v-packing ring made in a special PTFE compound (5). A flushing ring (6) with integrated seal allows any leakage to drain away via the hose connector (7), and protects all other parts from contact with the chemical.

A flushing tube can also be attached as standard. Flushing should be incorporated if pumps are to be used with very aggressive or poisonous chemicals, or with abrasive chemicals.

The piston causes the pressure build up in the liquid end (2) which, together with the precise double ball valves (1), results in very accurate dosing. The piston dosing pump will run for long periods without maintenance and the pre-stressed v-packing ring ensures that it will remain watertight under a range of pressure conditions.

Assembly of piston and liquid end

1. Place piston (4) onto push ring and screw on coupling bolt, do not tighten
2. Push entire head onto piston and screw firmly to flange
3. Now tighten piston coupling nut.

Important: Take care not to damage the seal lips of the new packing ring if replacing.

3. Technical Data

3.1 MTMa Capacity Data

| Pump Type | with 1500 rpm motor at 50 Hz | | | | with 1800 rpm motor at 60 Hz | | | | | | | | |
|-------------------------------|--|-------------|-------------------|-----|--|-------------------|--------------|---|-------------------------------------|--------------------|-----------------|----------|--|
| | Pump Capacity At Maximum Back Pressure | Max. Stroke | Max. Stroke Freq. | | Pump Capacity At Maximum Back Pressure | Max. Stroke Freq. | Suction Lift | Permiss. Admission Pressure, Suction Side | Connec- tion Suction/ Pressure Side | Motor Power Output | Shipping Weight | | |
| Identity code bar MTMa (4 mm) | l/h | ml/ stroke | strokes/ min. | psi | l/h/gph | strokes/ min. | mWG | bar | G-DN | kW | Kg | | |
| 12065 | 10.0/12* | 65/ 62* | 15.0 | 72 | 145 | 78/ 20.6 | 86 | 5 | 2.8 | 1 1/4 - 20 | 0.18 | 16.0/21* | |
| 12086 | 10.0/12* | 86/ 83* | 15.0 | 96 | 145 | 104/ 27.5 | 115 | 5 | 2.8 | 1 1/4 - 20 | 0.18 | 16.0/21* | |
| 12108 | 10.0/12* | 108/104* | 15.0 | 120 | 145 | 130/ 34.3 | 144 | 5 | 2.8 | 1 1/4 - 20 | 0.18 | 16.0/21* | |
| 12130 | 10.0/12* | 130/125* | 15.0 | 144 | 145 | 156/ 41.2 | 173 | 5 | 2.8 | 1 1/4 - 20 | 0.18 | 16.0/21* | |
| 10130 | 10.0 | 130 | 30.0 | 72 | 145 | 156/ 41.2 | 86 | 3 | 1.3 | 1 1/4 - 20 | 0.18 | 16.0/21* | |
| 09173 | 9.0 | 173 | 30.0 | 96 | 131 | 208/ 54.9 | 115 | 3 | 1.3 | 1 1/4 - 20 | 0.18 | 16.0/21* | |
| 07216 | 7.5 | 216 | 30.0 | 120 | 109 | 260/ 68.7 | 144 | 3 | 1.3 | 1 1/4 - 20 | 0.18 | 16.0/21* | |
| 06260 | 6.0 | 260 | 30.0 | 144 | 87 | 312/ 82.4 | 173 | 3 | 1.3 | 1 1/4 - 20 | 0.18 | 16.0/21* | |
| 05265 | 5.0 | 265 | 61.3 | 72 | 72.5 | 318/ 84.0 | 86 | 2 | 0.5 | 1 1/2 - 25 | 0.18 | 19.5/28* | |
| 04253 | 4.5 | 353 | 61.3 | 96 | 65.3 | 424/112 | 115 | 2 | 0.5 | 1 1/2 - 25 | 0.18 | 19.5/28* | |
| 03441 | 3.5 | 441 | 61.3 | 120 | 50.8 | 530/140 | 144 | 2 | 0.5 | 1 1/2 - 25 | 0.18 | 19.5/28* | |
| 03530 | 3.0 | 530 | 61.3 | 144 | 43.5 | 637/168 | 173 | 2 | 0.5 | 1 1/2 - 25 | 0.18 | 19.5/28* | |
| 10173 | 10.0 | 173 | 30.0 | 96 | 145 | 208/ 54.9 | 115 | 3 | 1.3 | 1 1/4 - 20 | 0.37 | 19.0/24* | |
| 10216 | 10.0 | 216 | 30.0 | 120 | 145 | 260/ 68.7 | 144 | 3 | 1.3 | 1 1/4 - 20 | 0.37 | 19.0/24* | |
| 10260 | 10.0 | 260 | 30.0 | 144 | 145 | 312/ 82.4 | 173 | 3 | 1.3 | 1 1/4 - 20 | 0.37 | 19.0/24* | |
| 05440 | 5.0 | 441 | 61.3 | 120 | 72.5 | 530/140 | 144 | 2 | 0.5 | 1 1/2 - 25 | 0.37 | 22.5/31* | |
| 05530 | 5.0 | 530 | 61.3 | 144 | 72.5 | 636/168 | 173 | 2 | 0.5 | 1 1/2 - 25 | 0.37 | 22.5/31* | |
| MTMa (6 mm) | | | | | | | | | | | | | |
| 10200 | 10.0 | 200 | 44.8 | 74 | 145 | 236/ 62 | 88 | 3 | 1.3 | 1 1/4 - 20 | 0.37 | 19.0/24* | |
| 10263 | 10.0 | 263 | 44.8 | 98 | 145 | 314/ 83 | 117 | 3 | 1.3 | 1 1/4 - 20 | 0.37 | 19.0/24* | |
| 10330 | 10.0 | 330 | 44.8 | 123 | 145 | 392/103 | 146 | 3 | 1.3 | 1 1/4 - 20 | 0.37 | 19.0/24* | |
| 09395 | 9.0 | 395 | 44.8 | 147 | 131 | - | - | 3 | 1.3 | 1 1/4 - 20 | 0.37 | 19.0/24* | |
| 04400 | 4.0 | 400 | 89.7 | 74 | 58 | 473/125 | 88 | 2 | 0.5 | 1 1/2 - 25 | 0.37 | 22.5/31* | |
| 04527 | 4.0 | 527 | 89.7 | 98 | 58 | 629/166 | 117 | 2 | 0.5 | 1 1/2 - 25 | 0.37 | 22.5/31* | |
| 03662 | 3.0 | 662 | 89.7 | 123 | 43.5 | 785/207 | 146 | 2 | 0.5 | 1 1/2 - 25 | 0.37 | 22.5/31* | |
| 03790 | 3.0 | 790 | 89.7 | 147 | 43.5 | - | - | 2 | 0.5 | 1 1/2 - 25 | 0.37 | 22.5/31* | |

* Data for material version SST

Materials In Contact With Chemicals

The following material versions are available as standard

| MTMa (4 mm) | Dosing Head | Suction/Discharge Connector | Seals | Valve Balls | Valve Seat |
|--------------------|-------------------------------|------------------------------|----------|-------------------------------|------------|
| PPE | Polypropylene | Polypropylene | EPDM | Borosilicate glass | EPDM |
| PCA | PVC | PVC | Viton® A | Borosilicate glass | Viton® A |
| TTT | PTFE with carbon | PTFE with carbon | PTFE | ceramic | PTFE |
| SST | stainless steel No. 1.4571 | stainless steel No. 14581 | PTFE | stainless steel No. 1.4401 | PTFE |
| MTMa (6 mm) | | | | | |
| PPT | Polypropylene | PVDF | PTFE | Borosilicate glass | PTFE |
| PCT | PVC | PVDF | PTFE | Borosilicate glass | PTFE |
| TTT | PTFE with carbon | PVDF | PTFE | ceramic | PTFE |
| SST | stainless steel No. 1.4571 | stainless steel No. 14581 | PTFE | stainless steel No. 1.4401 | PTFE |

DEVELOPAN® PTFE coated pump diaphragm.

Viton® is a registered trademark of DuPont Dow Elastomers.

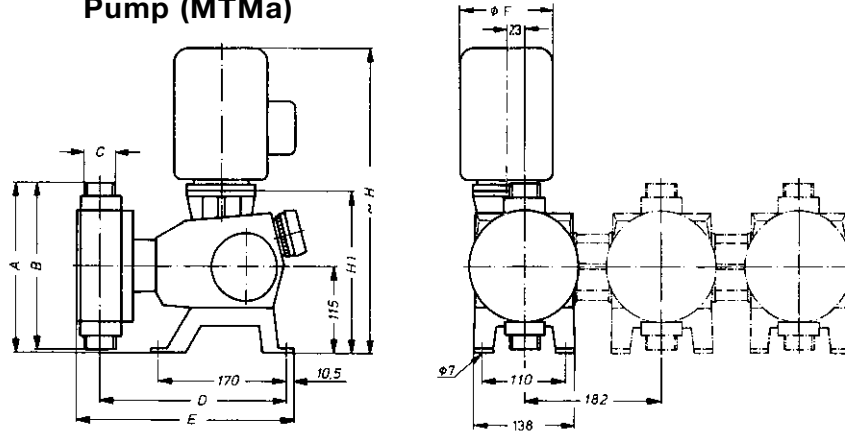
3.2 MTKa Capacity Data

| Pump Type | with 1500 rpm motor at 50 Hz | | | | with 1800 rpm motor at 60 Hz | | | | | | | | | | | | | |
|--------------------|--|-------------------|--|-------------------|------------------------------|--|------------------------------------|--------------------|---------------------------------------|-------|---------|---------------|-----|-----|-------|----|----|--|
| | Pump Capacity At Maximum Back Pressure | Max. Stroke Freq. | Pump Capacity At Maximum Back Pressure | Max. Stroke Freq. | Suction Lift | Permissible Admission Pressure, Suction Side | Connec-tion Suction/ Pressure Side | Motor Power Output | Shipping Weight | psi | l/h/gph | strokes/ min. | mWG | bar | Rp-DN | kW | kg | |
| Identity code MTKa | bar | l/h | ml/ stroke | strokes/ min. | psi | l/h/gph | strokes/ min. | mWG | bar | Rp-DN | kW | kg | | | | | | |
| 21606 | 216 | 6.1 | 1.42 | 72 | 3130 | 7.3/ 1.9 | 86 | 4 | | 1/4 | 0.18 | 18 | | | | | | |
| 24006 | 240 | 6.1 | 1.42 | 72 | 3477 | 7.3/ 1.9 | 86 | 4 | | 1/4 | 0.37 | 20 | | | | | | |
| 16208 | 162 | 8.1 | 1.42 | 96 | 2347 | 9.8/ 2.5 | 115 | 4 | | 1/4 | 0.18 | 18 | | | | | | |
| 22508 | 225 | 8.1 | 1.42 | 96 | 3260 | 9.8/ 2.5 | 115 | 4 | | 1/4 | 0.37 | 20 | | | | | | |
| 12910 | 129 | 10.2 | 1.42 | 120 | 1878 | 12.2/ 3.2 | 144 | 4 | | 1/4 | 0.18 | 18 | | | | | | |
| 21610 | 216 | 10.2 | 1.42 | 120 | 3130 | 12.2/ 3.2 | 144 | 4 | | 1/4 | 0.37 | 20 | | | | | | |
| 10812 | 108 | 12.2 | 1.42 | 144 | 1565 | 14.7/ 3.8 | 173 | 4 | | 1/4 | 0.18 | 18 | | | | | | |
| 21012 | 210 | 12.2 | 1.42 | 144 | 3043 | 14.7/ 3.8 | 173 | 4 | | 1/4 | 0.37 | 20 | | | | | | |
| 10213 | 102 | 13.0 | 3.01 | 72 | 1479 | 15.6/ 4.0 | 86 | 4 | approx. 50 % of max. permissible head | 1/4 | 0.18 | 18 | | | | | | |
| 11313 | 113 | 13.0 | 3.01 | 72 | 1644 | 15.6/ 4.0 | 86 | 4 | | 1/4 | 0.37 | 20 | | | | | | |
| 07617 | 76 | 17.3 | 3.01 | 96 | 1109 | 20.8/ 5.4 | 115 | 4 | | 1/4 | 0.18 | 18 | | | | | | |
| 10617 | 106 | 17.3 | 3.01 | 96 | 1541 | 20.8/ 5.4 | 115 | 4 | | 1/4 | 0.37 | 20 | | | | | | |
| 06122 | 61 | 21.7 | 3.01 | 120 | 888 | 26.0/ 6.8 | 144 | 4 | | 1/4 | 0.18 | 18 | | | | | | |
| 10222 | 102 | 21.7 | 3.01 | 120 | 1479 | 26.0/ 6.8 | 144 | 4 | | 1/4 | 0.37 | 20 | | | | | | |
| 05126 | 51 | 26.0 | 3.01 | 144 | 740 | 31.2/ 8.2 | 173 | 4 | | 1/4 | 0.18 | 18 | | | | | | |
| 09926 | 99 | 26.0 | 3.01 | 144 | 1438 | 31.2/ 8.2 | 173 | 4 | | 1/4 | 0.37 | 20 | | | | | | |
| 05425 | 54 | 24.6 | 5.71 | 72 | 782 | 29.5/ 7.7 | 86 | 4 | | | 3/8 | 0.18 | 18 | | | | | |
| 06025 | 60 | 24.6 | 5.71 | 72 | 869 | 29.5/ 7.7 | 86 | 4 | | | 3/8 | 0.37 | 20 | | | | | |
| 04033 | 40 | 32.8 | 5.71 | 96 | 587 | 39.4/10.3 | 115 | 4 | | 3/8 | 0.18 | 18 | | | | | | |
| 05633 | 56 | 32.8 | 5.71 | 96 | 815 | 39.4/10.3 | 115 | 4 | | 3/8 | 0.37 | 20 | | | | | | |
| 03241 | 32 | 41.1 | 5.71 | 120 | 469 | 49.3/12.9 | 144 | 4 | | 3/8 | 0.18 | 18 | | | | | | |
| 05441 | 54 | 41.1 | 5.71 | 120 | 782 | 49.3/12.9 | 144 | 4 | | 3/8 | 0.37 | 20 | | | | | | |
| 02749 | 27 | 49.3 | 5.71 | 144 | 391 | 59.2/15.6 | 173 | 4 | | 3/8 | 0.18 | 18 | | | | | | |
| 05249 | 52 | 49.3 | 5.71 | 144 | 761 | 59.2/15.6 | 173 | 4 | | 3/8 | 0.37 | 20 | | | | | | |

Materials In Contact With Chemicals

| | Dosing Head | Suction/ Discharge Connector | Seals | Valve Balls | Valve Seat | Pistons |
|------------|-----------------|------------------------------|--------------------|-------------|-----------------|---------|
| SST | stainless steel | stainless steel | PTFE | oxide | stainless steel | oxide |
| | No.1.4571 | No. 1.4581 | PTFE with graphite | ceramic | No. 1.4571 | ceramic |

3.3 Specification Sheet for ProMinent® Meta Diaphragm Dosing Pump (MTMa)

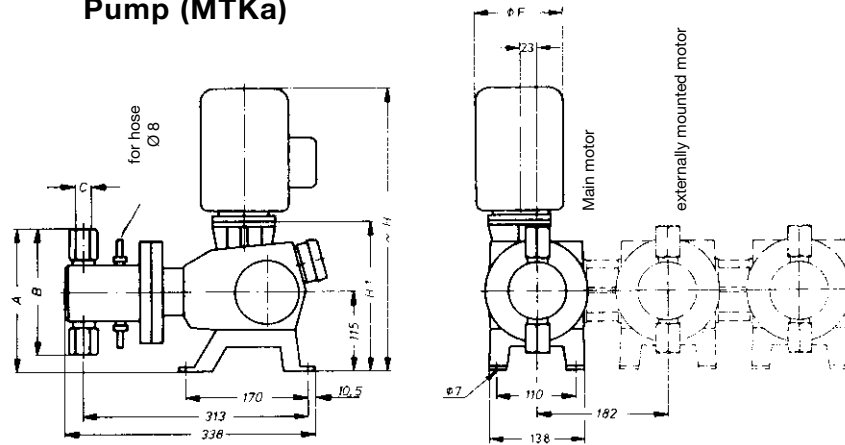


1186/3.1

Measurement Table

| Type | Liquid end | Head dia. | Connector | A | B | C | D | E |
|---|--|--|-----------|-----|--|----------|---|-----|
| 12065, 12086, 12108, 12130 | FM 130 | 145/ 76 | DN 20 | 224 | 217 | R 1 1/4" | 266 | 313 |
| 10130, 09173, 07216, 06260, 10173, 10216, 10260, 10200, 10263, 10330, 09395 | FM 260 | 145/104 | DN 20 | 224 | 217 | R 1 1/4" | 266 | 313 |
| 05265, 04353, 03441, 03530, 05440, 05530, 04400, 04527, 03662, 03790 | FM 530 | 180/143 | DN 25 | 248 | 266 | R 1 1/2" | 271 | 321 |
| Height dimensions for MTMa + MTKa | Standard motor Size: 63: 0.18 kW B14 (V 18), mounting dia. 90 | 1 Phase DC motor Size: 71, 0.37 kW Mounting flange dia. 140 and 160 | | | Variable speed air cooled motors Mounting flange dia. 140 0.37 kW/0.75 kW | | Drive with mounting flange 56 C/138 | |
| Measurement H1 | 213 | 220 | | | 220 | | 242 | |
| Measurement H approx. | 396 | 421 | | 440 | / 583 | | — | |

3.4 Specification Sheet for ProMinent® Meta Piston Dosing Pump (MTKa)



1174/4.1

Measurement Table

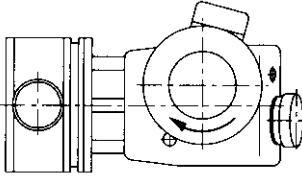
| Type | Liquid end | A | B | C |
|---|------------|-------|-----|--------|
| 21606, 24006, 16208, 22508, 12910, 21610, 10812, 21012 | FK 12.5 | 197.5 | 165 | R 1/4" |
| 10213, 11313, 07617, 10617, 06122, 10222, 05126, 09926 | FK 25 | 197.5 | 165 | R 1/4" |
| 05425, 06025, 04033, 05633, 03241, 05441, 02749, 05249 | FK 50 | 202.5 | 175 | R 3/8" |

3.5 Motor Data

The ProMinent® Meta dosing pumps are generally supplied with a 3 phase variable speed motor. Custom motors can be supplied with single phase capacitor motors or explosion proof motors.

WARNING:

Check direction of rotation when connecting motors



Check direction of rotation!

Technical Data for Meta Standard 3-phase Motor

| | | |
|-----------------------------|--|--|
| Power: | 0.18 kW | 0.37 kW |
| Standard frequency: | 50/60 Hz | 50/60 Hz |
| Standard voltage: | Y 380-420 V/380-460 V Δ 220-242 V/220-265 V | Y 380-420 V/380-460 V Δ 220-242 V/220-265 V |
| Synchro speed: | 1500/1800 1/min | 1500/1800 1/min |
| Standard speed: | 1270/1680 1/min | 1420/1720 1/min |
| Standard current: | Y 0.7 /1.2 A Δ 0.69/1.1 A | Y 1.3/2.3 A Δ 1.1/1.9 A |
| Power factor: | 0.68/0.67 | 0.70/0.70 |
| Enclosure rating: | IP 55 | IP 55 |
| Insulation materials class: | F | F |
| Construction: | IM _U V 18 | IM _U V 18 |
| Size: | 63 | 71 |
| Mounting diameter: | 90 mm | 140 mm |

The technical data sheets for explosion proof and custom voltages are available on request.

3.6 Sound intensity level

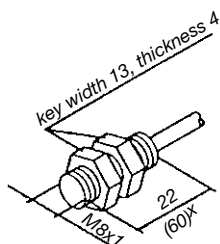
The sound intensity level is < 70 dB (A) at maximum stroke, maximum stroke rate, maximum back pressure (water) in accordance with:

DIN EN ISO 3744 (Reproducibility 2 Determining Sound intensity level)

PR DIN EN 12639 (Metering Pump Noise Measurement)

DIN 45635-24 (Maschine Noise Measurement)

3.7 Meta Stroke Sensor Electrical Data



Material stainless steel

Switch aperture s_n inset 1.5 mm flush
See figure above

Electrical cabling: DC, two wire, as DIN 19 234 (NAMUR)

Fixtures:
as DIN 19 234 (NAMUR) NJ 1.5-8GM-N

Features:

Operating switch apertures s_a $0 \leq s_a \leq 0.81 s_n$

Reduction factor at V2A 0.85; Al 0.4; Cu 0,3

Reproducibility R ≤ 0.01 mm

Switch hysteresis H approx. 10 %

Standard measurement plate 1 mm Fe 8 mm x 8 mm

Operating voltage U_B 5 to 25 V DC

Residual ripple ≤ 5 %

Switch frequency f 5 kHz

Electrical Data:

Standard voltage 8 V DC (Ri approx. 1 k/ohm)

Individual inductivity 20 μ H

Individual capacity 16 nF

Output/ power uptake
active surface free ≤ 3 mA
active surface covered ≤ 1 mA

Mechanical Data:

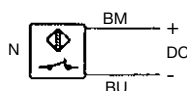
Ambient temperature 248 - 373 Kelvin
(-25 °C to +100 °C)

Enclosure rating as DIN 40 050 IP 67

Permissible impact and Oscillation stress $b \leq 30g, T \leq 11$ ms
 $f \leq 55$ Hz, $a \leq 1$ mm

Connector 2 m PVC lead, 0.14 mm²

Standard symbol/connection:



4. Commissioning / Maintenance

WARNING:

Observe safety guidelines outlined in section 1.

4.1 Commissioning

See general instructions given in the accompanying Operating Instructions manual “ProMinent® Motor-Driven Dosing Pumps”.

4.2 Maintenance

Ongoing maintenance and inspections:

- Check liquid end screws are firmly in place
- Check tubing is firmly in place (injection and suction sides)
- Check injection and suction valves are firmly in place
- Check drainage hole in head disc for blockage (may indicate diaphragm rupture).
- Operate pump in continuous mode for a while to check feed is operating correctly.

Maintenance intervals

General maintenance interval requirement, once a quarter.

When in constant or heavy use, we recommend more frequent maintenance.

The gear oil should be changed after approx. 5000 operating hours.

Gear oil ISO, viscosity class VG 460, e.g. Mobil Gear 634, ProMinent part no. 555325 (oil quantity approx. 0.5 l).

The dosing diaphragm is a consumable item. Its operating life depends upon the following conditions:

- Back pressure in the system
- Operating temperature
- Properties of dosing chemical

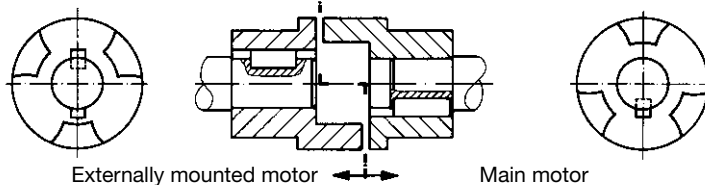
Abrasive chemicals will shorten the life of the diaphragm. We recommend more frequent checks on the diaphragm or the installation of a diaphragm rupture alarm when using the pump with abrasive chemicals.

4.3 Replacing Consumable Items

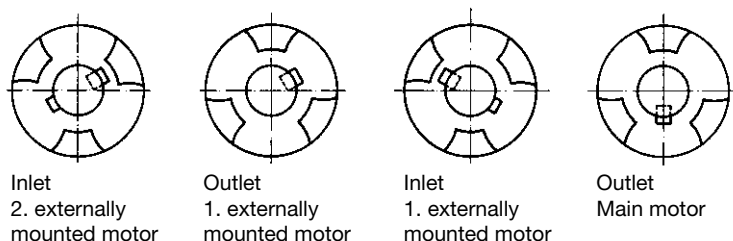
See sections 2.2.4 and 2.2.5

4.4 Assembly of Interlocking External Motors

Duplex pump



Triplex pump



5. Conformity Declaration

EC Declaration of Conformity

We,

**ProMinent Dosiertechnik GmbH
Im Schuhmachergewann 5-11
D-69123 Heidelberg**

hereby declare that, on the basis of its functional concept and design and in the version brought into circulation by us, the product specified in the following complies with the relevant, fundamental safety and health stipulations laid down by EC regulations.

Any modification to the product not approved by us will invalidate this declaration.

Product description:

Metering pump , Series Meta

Product type:

MTMa, MTKa

Serial number:

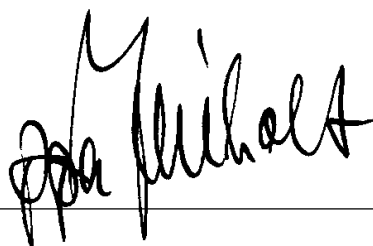
see type identification plate overleaf and on device

Relevant EC regulations:

***EC - machine regulation (89/392/EEC) subsequently 93/44/EEC
EC - low voltage regulation (73/23/EEC)
EC - EMC - regulation 89/336/EEC subsequently 92/31/EEC***Harmonised standards used,
in particular:***EN 292-1, EN 292-2, EN 809
EN 60335-2-41
EN 50081-1/2, EN 50082-1/2, EN 55014
EN 60555-2, EN 60555-3***National standards and other
technical specifications used,
in particular:***DIN VDE 0530 T1***

Date / manufacturer's signature:

07.02.1997



The undersigned:

Mister Manfred Hüholt , factory manager