

## aquaconcept®

The unique aquaconcept® modular design covers a wide range of water applications. This innovative system offers all types of water measurement right up to data integration into your specific management software.



### Product features

- › System modules for updating domestic water meters
- › Open to all future water management systems
- › Integrated key technologies
- › Rugged domestic water meters with high accuracy and long service life
- › Reliable Swiss precision
- › Internal interface for system modules

### Customer benefits

- › Innovative technology from a single source
- › Design safety can be updated at any time
- › Simple and user-friendly technology
- › Significant increase in added value with accurate flow measurement
- › Lower shelf-life costs

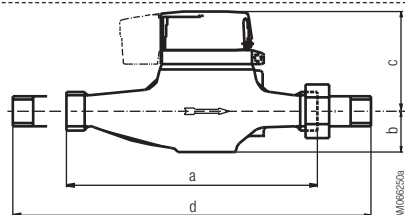
# Product range

## PMK-aquabasic®



- › Multi-jet impeller meters with dry registers
- › Measuring range to OIML R 49
- › Error tolerance  $\pm 2\%$  of measured value in upper range  $Q_2 \leq Q < Q_4$  and  $\pm 5\%$  in lower range  $Q_1 < Q < Q_2$
- › For mounting in horizontal pipes
- › Brass body with threaded connections
- › Nominal pressure PN 16
- › Medium temperature max. 40 °C
- › IP 66 or IP 68
- › Internal interface for system modules

| Nominal diameter                     | DN      | mm       | 15        | 20                | 25      | 32      | 40      | 50      |
|--------------------------------------|---------|----------|-----------|-------------------|---------|---------|---------|---------|
|                                      |         | inches   | 1/2       | 3/4               | 1       | 1 1/4   | 1 1/2   | 2       |
| Standard                             |         | Art. No. | 92503     | 92505             | 92511   | 92517   | 92520   | 92526   |
| IP 68                                |         | Art. No. | -         | 93688             | 93689   | 93690   | 93691   | 93692   |
| with drainage unit                   |         | Art. No. | -         | 92509             | 92515   | -       | -       | -       |
| Flow on overload                     | $Q_4$   | m³/h     | 3         | 5                 | 7.9     | 12.5    | 20      | 31      |
| Continuous flow                      | $Q_3$   | m³/h     | 2.5       | 4                 | 6.3     | 10      | 16      | 25      |
| Transitional flow rate               | $Q_2$   | m³/h     | 0.032     | 0.04              | 0.063   | 0.1     | 0.16    | 0.25    |
| Min. flow                            | $Q_1$   | m³/h     | 0.02      | 0.025             | 0.039   | 0.063   | 0.1     | 0.156   |
| Starting flow at approx.             |         | m³/h     | 0.008     | 0.008             | 0.022   | 0.022   | 0.045   | 0.045   |
| Max. pressure drop at $Q_3$          |         | bar      | 0.3       | 0.6               | 0.4     | 0.6     | 0.4     | 0.6     |
| Flowrate at $\Delta p = 1\text{bar}$ | $Q$     | m³/h     | 4.5       | 5.2               | 9.5     | 12.7    | 25.6    | 32.5    |
| Measuring range                      |         |          | R125      | R160              | R160    | R160    | R160    | R160    |
| Smallest recordable volume           |         | litres   | 0.1       | 0.1               | 0.1     | 0.1     | 0.1     | 0.1     |
| Recording capacity                   |         | m³       | 100'000   | 100'000           | 100'000 | 100'000 | 100'000 | 100'000 |
| Body thread size                     |         | inches   | 3/4       | 1                 | 1 1/4   | 1 1/2   | 2       | 2 3/8   |
| Connection thread size               |         | inches   | 1/2       | 3/4               | 1       | 1 1/4   | 1 1/2   | 2       |
| Body surface finish                  |         |          | lacquered |                   |         |         |         |         |
| Weight without connections           | approx. | kg       | 1.4       | 1.6               | 2.4     | 2.7     | 5.4     | 6.7     |
| Overall length                       |         |          |           |                   |         |         |         |         |
| a                                    |         |          | 165       | 220 <sup>1)</sup> | 260     | 260     | 300     | 300     |
| b                                    |         |          | 35.5      | 36.5              | 40      | 40      | 60      | 62      |
| c                                    |         |          | 79        | 88                | 96      | 96      | 106     | 113     |
| d                                    |         |          | 259       | 314               | 374     | 374     | 440     | 460     |



1) available with face-to-face length of 190 mm (d = 285), Art. No. 92504

## Pressure loss curves

See page 7

## Approvals

MID SVGW

## PMKB-aquabasic® (bayonet connection)



- › Multi-jet impeller meters with dry registers
- › Measuring range to OIML R 49
- › Error tolerance  $\pm 2\%$  of measured value in upper range  $Q_2 \leq Q < Q_4$  and  $\pm 5\%$  in lower range  $Q_1 < Q < Q_2$
- › For mounting in horizontal or vertical pipes
- › Brass body with connections for bayonet modules (quick-fit coupling); short mounting time when changing meters
- › Medium temperature max. 40 °C
- › IP 66 / optional IP 68
- › Internal interface for system modules

| Nominal diameter                                       | DN | mm<br>inches    | 20<br>3/4                                      | 25<br>1      |              |              |              |
|--------------------------------------------------------|----|-----------------|------------------------------------------------|--------------|--------------|--------------|--------------|
| Standard                                               |    | Art. No.        | 92506                                          | 92512        |              |              |              |
| IP 68                                                  |    | Art. No.        | 93810                                          | 93811        |              |              |              |
| Flow on overload                                       | Q4 | m³/h            | 5                                              | 7.9          |              |              |              |
| Continuous flow                                        | Q3 | m³/h            | 4                                              | 6.3          |              |              |              |
| Transitional flow rate                                 | Q2 | m³/h            | 0.04                                           | 0.063        |              |              |              |
| Min. flow                                              | Q1 | m³/h            | 0.025                                          | 0.039        |              |              |              |
| Starting flow at approx.                               |    | m³/h            | 0.008                                          | 0.018        |              |              |              |
| Max. pressure drop at Q3                               |    | bar             | 0.5                                            | 0.8          |              |              |              |
| Flowrate at Δp = 1bar                                  | Q  | m³/h            | 5.6                                            | 6.9          |              |              |              |
| Measuring range                                        |    |                 | R160                                           | R160         |              |              |              |
| Smallest recordable volume                             |    | litres          | 0.1                                            | 0.1          |              |              |              |
| Recording capacity                                     |    | m3              | 100'000                                        | 100'000      |              |              |              |
| Body surface finish                                    |    |                 | lacquered                                      |              |              |              |              |
| Weight (with bayonet module approx.                    |    | kg              | 2.0 (105 mm)<br>2.66 (220 mm)<br>2.46 (122 mm) | 2.4<br>2.95  |              |              |              |
| Overall length c                                       |    | mm              | 162                                            | 162          |              |              |              |
| <b>Bayonet modules</b>                                 |    | <b>Art. No.</b> | <b>80613</b>                                   | <b>81332</b> | <b>81333</b> | <b>80615</b> | <b>80614</b> |
| Face-to-face length a                                  |    | mm              | 105                                            | 122          | 122          | 150          | 220          |
| When used with PMKB-basic                              |    | DN              | 20                                             | 25           | 25           | 20/25        | 20           |
| Bayonet module thread                                  |    | inches          | 1                                              | 1 1/4 1)     | 1 1/2 1)     | 1 1/4        | 1            |
| Screw thread on connection                             |    | inches          | 3/4                                            | 1            | 1 1/4        | 1            | 3/4          |
| Face-to-face length<br>with connection                 |    | inches          | 200                                            | -            | -            | 265          | 315          |
| <b>Accessories</b>                                     |    |                 |                                                |              |              |              |              |
| Extension nipple for face-to-<br>face length of 190 mm |    |                 | 81336                                          | -            | -            | -            | -            |
| Extension nipple for face-to-<br>face length of 220 mm |    |                 | 81335                                          | -            | -            | -            | -            |
| Extension nipple for face-to-<br>face length of 260 mm |    |                 | -                                              | -            | -            | 80002        | -            |

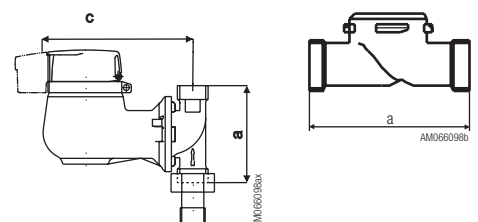
1) on the inlet side with cap nut

## Pressure loss curves

See page 8

## Approvals

MID SVGW (DN 20)

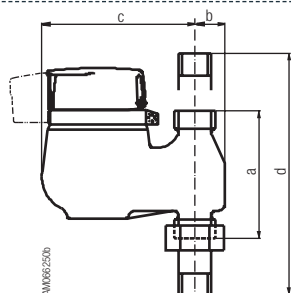


## PMKF-aquabasic® PMKF (downward flow) and PMKS-aquabasic® (upward flow)



- › Multi-jet impeller meters with dry registers
- › Measuring range to OIML R 49
- › Error tolerance  $\pm 2\%$  of measured value in upper range  $Q_2 \leq Q < Q_4$  and  $\pm 5\%$  in lower range  $Q_1 < Q < Q_2$
- › For mounting in vertical pipes (PMKF downward flow, PMKS upward flow)
- › Brass body with threaded connections
- › Nominal pressure PN 16
- › Medium temperature max. 40 °C
- › IP 66 / optional IP 68
- › Internal interface for system modules

| Nominal diameter                     | DN   | mm<br>inches   | 20<br>3/4 | 25<br>1 | 32<br>1 1/4 | 40<br>1 1/2 |
|--------------------------------------|------|----------------|-----------|---------|-------------|-------------|
| standard                             | PMKF | Art. No.       | 92507     | 92513   | 92518       | 92521       |
|                                      | PMKS | Art. No.       | 92508     | 92514   | 92519       | 92522       |
| Flow on overload                     | Q4   | m³/h           | 5         | 7.9     | 12.5        | 20          |
| Continuous flow                      | Q3   | m³/h           | 4         | 6.3     | 10          | 16          |
| Transitional flow rate               | Q2   | m³/h           | 0.04      | 0.063   | 0.1         | 0.256       |
| Min. flow                            | Q1   | m³/h           | 0.025     | 0.039   | 0.063       | 0.16        |
| Starting flow at approx.             |      | m³/h           | 0.014     | 0.022   | 0.022       | 0.045       |
| Max. pressure drop at Q3             | PMKF | bar            | 0.5       | 0.5     | 0.9         | 0.5         |
| Max. pressure drop at Q3             | PMKS | bar            | 0.5       | 0.4     | 0.5         | 0.6         |
| Flowrate at $\Delta p = 1\text{bar}$ | PMKF | m³/h           | 5.4       | 8.6     | 10.3        | 22.2        |
| Flowrate at $\Delta p = 1\text{bar}$ | PMKS | m³/h           | 6.0       | 9.7     | 13.6        | 20.8        |
| Measuring range                      |      |                | R160      | R160    | R160        | R100        |
| Smallest recordable volume           |      | litres         | 0.1       | 0.1     | 0.1         | 0.1         |
| Recording capacity                   |      | m³             | 100'000   | 100'000 | 100'000     | 100'000     |
| Body thread size                     |      | inches         | 1         | 1 1/4   | 1 1/2       | 2           |
| Connector thread size                |      | inches         | 3/4       | 1       | 1 1/4       | 1 1/2       |
| Body surface finish                  |      |                | lacquered |         |             |             |
| Weight without connections           |      | approx. kg     | 1.8       | 2.4     | 2.7         | 5.0         |
|                                      |      | Overall length | a         | b       | c           | d           |
|                                      |      |                | 105       | 150     | 150         | 200         |
|                                      |      |                | 25        | 30      | 30          | 54          |
|                                      |      |                | 126       | 148     | 148         | 198         |
|                                      |      |                | 199       | 264     | 264         | 340         |



1) max. 1 hour per day

## Pressure loss curves

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## Approvals

MID SVGW

# System modules

## aquareader®

The aquareader® module is an automatic readout device with an M-Bus or CS interface. The module does not require a battery as it is supplied with energy when connected to a powered bus. If the water meter is equipped with a RFID-tag, the aquareader® will take the data from the tag, set its own parameters and thus be operational in seconds. Upon request, the aquareader® system module reads out the current meter reading, the identification number, the nominal width and the medium. It can then be disconnected again from the bus. Readouts and manual configuration require AMBUS® WIN II software for the M-Bus version and AMBILL® pocket for the CS version (for system requirements, see software documentation).



| <b>aquareader® CS</b>             | <b>Version</b>                                                                 | <b>Art. No.</b> |
|-----------------------------------|--------------------------------------------------------------------------------|-----------------|
| CS interface                      | with socket system Volag (IP 54)                                               | 80754           |
|                                   | with socket system BKW (IP 32)                                                 | 80756           |
|                                   | with cable gland (IP 66)                                                       | 80755           |
| Reading                           | via CS interface on the meter or via remote transmission                       |                 |
| Readout                           | actual meter reading, identification number of meter, medium, nominal width    |                 |
| Data interface                    | CS interface according IEC 62056-21 (IEC 1107), 300 to 9600 Baud               |                 |
| Parameterization                  | automatically from data of RFID tag or manually with parameterization software |                 |
| Parameterization software         | AMBILL® pocket                                                                 |                 |
| Ingress protection                | IP 66                                                                          |                 |
| Power supply                      | via the CS interface                                                           |                 |
| Ambient temperature               | 0 to 55 °C                                                                     |                 |
| Transport and storage temperature | -20 to 70 °C                                                                   |                 |
| Permissible ambient humidity      | max. 98 % relative humidity                                                    |                 |



| <b>aquareader® M-Bus</b>          | <b>Version</b>                                                                                               | <b>Art. No.</b> |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------|
| M-Bus                             | with socket system Volag and (IP 54)                                                                         | 80751           |
|                                   | with socket system BKW (IP 32)                                                                               | 80753           |
|                                   | with cable gland (IP 66)                                                                                     | 80752           |
| Reading                           | via M-Bus interface on the meter or via remote transmission with the radio controller aquaradio® smart M-Bus |                 |
| Readout                           | actual meter reading, identification number of meter, medium, nominal width                                  |                 |
| Data interface                    | M-Bus according EN 13757 (EN 1434-3), 300/2400* /9600 Baud                                                   |                 |
| Addressing                        | primary address 0* -250 / secondary address 8-digit extended secondary address with manufacturer's ID        |                 |
| Parameterization                  | automatically from data of RFID tag or manually with AMBUS® Win II                                           |                 |
| Parameterization software         | AMBUS® Win II                                                                                                |                 |
| Ingress protection                | IP 66                                                                                                        |                 |
| Power supply                      | M-Bus max. 3 mA (2x standard load)                                                                           |                 |
| Ambient temperature               | 0 to 55 °C                                                                                                   |                 |
| Transport and storage temperature | -20 to 70 °C                                                                                                 |                 |
| Permissible ambient humidity      | max. 98 % relative humidity                                                                                  |                 |

\* Factory settings

## aquadata® M-Bus

The aquadata® M-Bus system module supplies an M-Bus protocol and pulses for triggering devices controlling remote displays, data transmission and filling procedures. The system module has an internal battery when there is a power failure to the M-Bus.



| <b>aquadata® M-Bus</b>         | <b>Art. No. 80517</b>                                                                                                         |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Pulse value                    | 1 litre*; can be set to 1 – 1,000 litre                                                                                       |
| Power supply                   | max. 1.5 mA (standard load)                                                                                                   |
| Internal battery               | 3 V Li, 6 + 4 reserve years operating life                                                                                    |
| Pulse output**                 | Open Collector, SO compatible to DIN 43864                                                                                    |
| Reverse flow monitoring        | yes, with compensation                                                                                                        |
| Max. switching capacity        | 27 VDC, 27 mA                                                                                                                 |
| Pulse duration                 | 50 ms                                                                                                                         |
| Data interface                 | M-Bus to EN 13757 (EN 1434-3), 300/2400 baud                                                                                  |
| Address                        | primary address 0-250 / secondary address 8-digit<br>extended secondary address with manufacturer's ID                        |
| M-Bus data readout             | current meter reading, due date, next due date,                                                                               |
| Telegram 1 (FCB:0)             | consumption at due date, identification number                                                                                |
| M-Bus data readout             | as Telegram 1 including 12 values of previous month                                                                           |
| Telegram 2 (FCB:1)             |                                                                                                                               |
| Protocol                       | production number, medium, pulse value, primary<br>address, meter reading, date, time, due date, meter<br>reading on due date |
| Meter reading                  | 0 m3; format: 00000,000 m3; freely selectable                                                                                 |
| Medium                         | water*, cold water, hot water freely selectable                                                                               |
| Due date                       | 31.12.*; freely selectable                                                                                                    |
| Parameterisation software      | AMBUS® WIN                                                                                                                    |
| Ingress protection             | IP 68                                                                                                                         |
| Ambient temperature, operation | 0 °C to 50 °C                                                                                                                 |
| Ambient temperature, storage   | - 20 °C to 60 °C                                                                                                              |
| Ambient humidity               | max. 98 % relative humidity, condensation permitted                                                                           |
| Cable length                   | 1.5 m, permanently attached, 4 x 0.14 mm2 with cable end<br>sleeves                                                           |
| Pin assignment                 | M-Bus: white/black<br>pulse: brown (+) / blue (-)                                                                             |

\* factory setting

\*\* electrically connected with M-Bus

## aquatarif®

The aquatarif® system module stores values on actual consumption and those of the previous year, peaks, the previous 400 days and 15 months as well as days with downtimes and leakages.



| <b>aquatarif®</b>                                                  | <b>Article No. 80119</b>                     | <b>Article No. 80220</b>                               |
|--------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------|
| Optical interface acc. to IEC 62056-21 (IEC 1107) for reading data | yes                                          | -                                                      |
| CS interface with permanently attached 5 m cable                   | -                                            | yes                                                    |
| Power supply                                                       | internal battery<br>operating life >10 years | internal battery<br>operating life >10 years           |
| Ingress protection                                                 | IP66                                         | IP68                                                   |
| Ambient temperature                                                | 0 to 50 °C                                   | 0 to 50 °C                                             |
| Transport and storage temperature                                  | -20 to 70 °C                                 | -20 to 70 °C                                           |
| Permissible ambient humidity                                       | max. 98 % relative humidity                  | max. 98 % relative humidity,<br>condensation permitted |

Article No. 80192 additional CS interface for Article No. 80119;

This consists of a plug-in terminal and a screwed cable connection. Maximum cable length 100 m, cross-section 0.5 mm2, cable to be supplied by the customer

## aquapuls® /aquapuls® NAMUR

The aquapuls® system module supplies pulses for controlling instruments, remote display, transmission and filling control units.



### aquapuls®

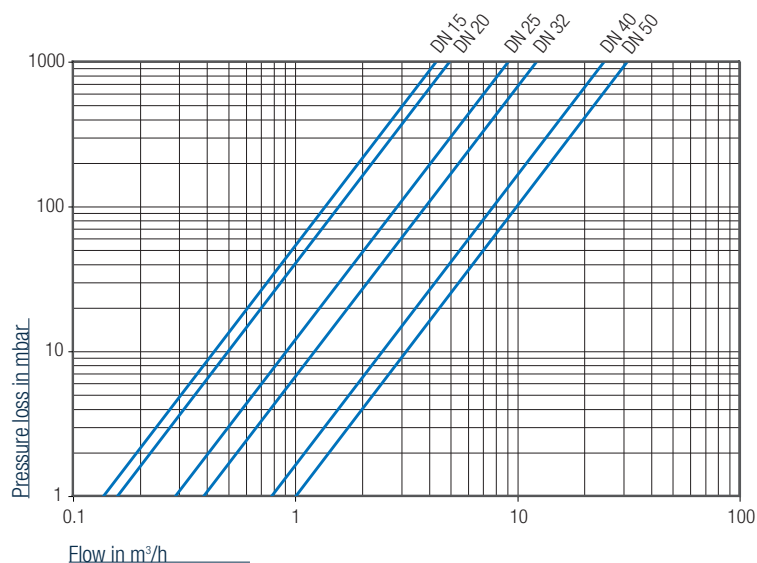
|                                    |                                                         |
|------------------------------------|---------------------------------------------------------|
| Pulse weighting 1 litre            | Art. No. 80113                                          |
| Pulse weighting 10 litres          | Art. No. 80114                                          |
| Pulse weighting 100 litres         | Art. No. 80115                                          |
| Power supply                       | internal battery                                        |
| Operating life                     | MnO <sub>2</sub> /Li 3 V battery >15 years              |
| Pulse duration                     | 1 litre = 50 ms / 10 litres = 500 ms / 100 litres = 5 s |
| Maximum switching capacity         | 48 VDC, 220 mA                                          |
| Reverse flow monitoring            | yes, with compensation                                  |
| Ingress protection                 | IP 68                                                   |
| Ambient temperature                | 0 to 50 °C                                              |
| Transport and storage temperature  | -20 to 70 °C                                            |
| Permissible ambient humidity       | max. 98 % relative humidity, condensation permitted     |
| Cable length, permanently attached | 1.5 m                                                   |

### aquapuls® NAMUR

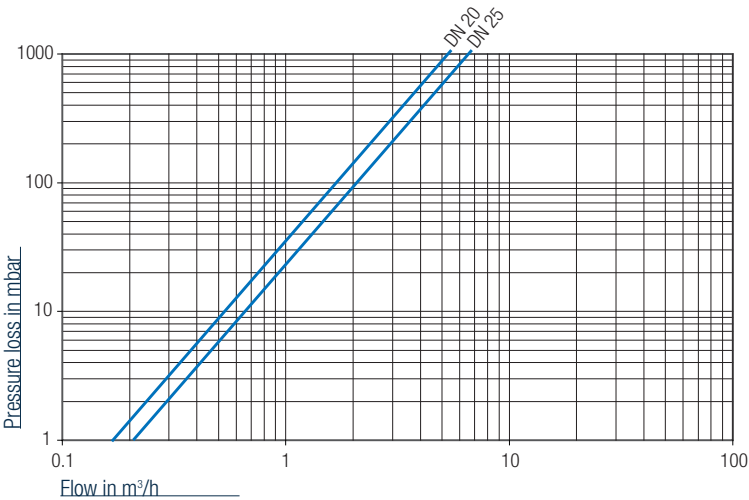
|                                                |                                                     |
|------------------------------------------------|-----------------------------------------------------|
| Pulse weighting 1 litre                        | Art. No. 80117                                      |
| Pulse weighting 100 litres                     | Art. No. 80119                                      |
| Power supply                                   | NAMUR DIN 19234                                     |
| Pulse duration                                 | 50 ms                                               |
| Maximum switching capacity                     | 27 VDC, 27 mA                                       |
| Reverse flow monitoring                        | yes, with compensation                              |
| Can be used as transmitter for<br>S0 interface | acc. to DIN 43864                                   |
| Ingress protection                             | IP 68                                               |
| Ambient temperature                            | 0 to 50 °C                                          |
| Transport and storage temperature              | -20 to 70 °C                                        |
| Permissible ambient humidity                   | max. 98 % relative humidity, condensation permitted |
| Cable length, permanently attached             | 1.5 m                                               |

## Pressure loss curves

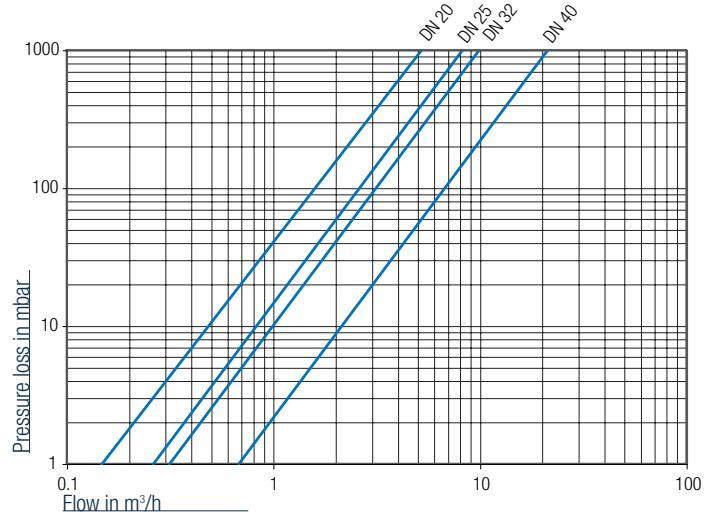
### aquabasic® PMK



**aquabasic® PMKB**



**aquabasic® PMKF**



**aquabasic® PMKS**

