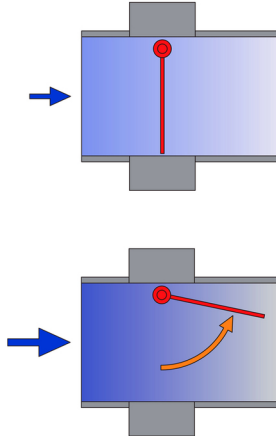


# Flap-type flow-meters KLA



Operating principle

- For liquids
- From ND 15 up to ND 200
- Horizontal or vertical mounting
- Independent of viscosity
- Outputs: 4-20 mA, contacts; ATEX versions

## APPLICATIONS

A flap-type flow-meter is ideal wherever a rugged, reliable and economical device is required for visualization and monitoring of flows.

## DESCRIPTION

The KLA series flow-meter is based on the same operating principle as the KFS series. Inside the meter a flap moves up and down in analogy to the amount of liquid flowing through.

In the KLA-GS version the quantity is directly indicated by the flap; The flow meter is equipped with hard glass screens at the front and at the back. The flow-rate reading is done on an integrated scale into the front hard glass screen. The economical version KLA Standard provides a direct visual display.

In both versions a magnet transmits the movement of the flap to a pointer in the case.

For process control, the measuring device can be equipped with:

- 1 or 2 inductive contacts
- 1 analogue transmitter, 4-20 mA output: angular position transducer  
The signal must be linearized.

## MODELS

|           |   |
|-----------|---|
| KLA       | Magnet coupling with pointer                |
| KLA-GS    | With glass window                           |
| KLA-IK    | With 1 inductive contact                    |
| KLA-IKS   | With 1 contact, 3-wire PNP                  |
| KLA-EM    | 4-20 mA output: angular position transducer |
| KLA-V4A   | Stainless steel AISI 316 Ti (1.4571)        |
| KLA Ex    | ATEX version                                |
| KLA-IK Ex | ATEX version with 1 inductive contact       |

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24-11-2020

D-713.12-EN-AA

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713-12/1

## TECHNICAL FEATURES

|   |  |
|---|--|
| Fittings                                | DN 15 - 200 / 1" - 8"<br>Flanges DIN EN 1092-1 to 3<br>Option: ANSI B16.5 150 lbs                                      |
| Nominal pressure                        | Standard: PN 10<br>(Specific version: PN 6)  |
| Corrosion protection                    | Epoxy powder coating, glossy blue RAL 5017<br>Rubber lining: NR-isoprene quality<br>Corrosion class : C3               |
| Liquid temperature limits <sup>1)</sup> | Max. 100 °C<br>Max. 90 °C with rubber lining<br>On request: up to 150 °C<br><sup>1)</sup> : The liquid must not freeze |
| Ambient temperature                     | Max. 90 °C   |
| Scale factor                            | 1:10   |
| Accuracy                                | 5 % F. S.  |
| Protection                              | IP 54<br>IP 53 with contacts   |

### Features of contacts: IK and IKS

|                       |  |
|-----------------------|--|
| <b>IK</b>             | 2-wire; Namur<br>Adjustable  |
| Type                  | Bistable (N.O./N.C.)   |
| Power supply          | NAMUR: 8.2 V DC (NAMUR)<br>Other applications: Max. 8 ... 20 V DC      |
| Consumption           | ≥ 2.1 mA<br>≤ 1.2 mA   |
| Repeatability         | ≤ 2 % F. S.  |
| Temperature drift     | ≤ ±10 %  |
| Hysteresis            | 1 ... 10 %   |
| Temperature stability | -25...+70 °C   |
| Approval              | According to KEMA 02 ATEX 1090X  |
| Certification Ex      | Ex II 2 G Ex ia IIC T6 Gb / II 1 D Ex ia IIIC T95 ° C Da               |
| SIL                   | According to IEC 61508: SIL 3 and PL                                   |
| Protection            | IP 67  |
| MTTF                  | According to SN 29500: 6,198 year (40 °C)<br>(Ed. 99) 40 °C            |
| Electrical connection | Cable Ø 3 mm, blue, Lif9YYW, PVC; 2 m long<br>2 x 0.14 mm <sup>2</sup> |

|                       |  |
|-----------------------|--|
| <b>IKS</b>            | 3-wire<br>PNP  |
| Type                  | Bistable (N.O./N.C.)   |
| Power supply          | 10 ... 30 V DC   |
| Repeatability         | ≤ 2 % F. S.  |
| Temperature drift     | ≤ ±10 %  |
| Hysteresis            | 3 ... 15 %   |
| Nominal current       | DC ≤ 100 mA  |
| No-load current       | ≤ 15 mA  |
| Residual current      | ≤ 0.1 mA   |
| Temperature stability | -25 ... +70 °C   |
| Protection            | IP 67  |
| MTTF                  | According to SN 29500: 2,283 years<br>(Ed. 99) 40 °C                     |
| Electrical connection | Cable Ø 3 mm, grey, Lif9Y-11Y, PUR; 2 m long<br>3 x 0.14 mm <sup>2</sup> |

### Features of Analogue Output: EM

|                       |   |
|-----------------------|---|
| <b>EM</b>             | 4 ... 20 mA; 3-wire                     |
| Accuracy              | ± 1 %                                   |
| Temperature drift     | < 50 ppm/ °C                            |
| Operating temperature | -20 ... +70 °C                          |
| Operating voltage     | Ub: 12 ... 36 V DC                      |
| Load impedance        | 300 Ω at Ub = 24 V<br>50 Ω at Ub = 12 V |
| Consumption           | < 0.2 W, load-free output               |
| Measuring cycle       | 250 ms                                  |
| Lifetime              | > 10 <sup>6</sup> cycles                |
| Protection            | IP 64                                   |

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713-12/2

24-11-2020

D-713.12-EN-AA

## MEASURING RANGES

| DN  | Range of water at 20 °C |                      | Maximum operating pressure |                            |
|-----|-------------------------|----------------------|----------------------------|----------------------------|
|     | Horizontal flow [m³/h]  | Vertical flow [m³/h] | Standard version [bar]     | Glass window version [bar] |
| 15  | 0.2 - 1                 | 0.2 - 1.5            | 10                         | 10                         |
|     | 0.3 - 6                 | 1 - 6.5              |                            |                            |
| 20  | 0.3 - 1                 | 0.5 - 1.5            | 10                         | 10                         |
|     | 0.3 - 6                 | 1 - 6.5              |                            |                            |
| 25  | 0.2 - 1                 | 0.2 - 1.5            | 10                         | 10                         |
|     | 0.3 - 6                 | 1 - 6.5              |                            |                            |
| 32  | 0.5 - 4                 | 0.5 - 4              | 10                         | 9                          |
|     | 0.7 - 7                 | 0.6 - 6              |                            |                            |
|     | 3 - 30                  | 2.5 - 25             |                            |                            |
| 40  | 0.5 - 4                 | 0.5 - 4              | 10                         | 9                          |
|     | 0.7 - 7                 | 0.6 - 6              |                            |                            |
|     | 3 - 30                  | 2.5 - 25             |                            |                            |
| 50  | 0.5 - 4                 | 0.5 - 4              | 10                         | 9                          |
|     | 0.7 - 7                 | 0.7 - 7              |                            |                            |
|     | 3 - 30                  | 3 - 30               |                            |                            |
| 65  | 1 - 8                   | 2 - 15               | 10                         | 10                         |
|     | 2 - 15                  | 4 - 15               |                            |                            |
|     | 4 - 50                  | 5 - 40               |                            |                            |
| 80  | 1 - 10                  | 2 - 10               | 10                         | 10                         |
|     | 2 - 20                  | 3 - 20               |                            |                            |
|     | 7 - 70                  | 5 - 50               |                            |                            |
| 100 | 1.5 - 15                | 1.5 - 15             | 10                         | 10                         |
|     | 12 - 120                | 10 - 100             |                            |                            |
| 125 | 2 - 20                  | 2 - 20               | 10                         | 7                          |
|     | 14 - 140                | 12 - 120             |                            |                            |
| 150 | 2 - 25                  | 4 - 25               | 10                         | 6,5                        |
|     | 5 - 50                  | 10 - 80              |                            |                            |
|     | 16 - 160                | 15 - 140             |                            |                            |
|     | 15 - 200 *)             | -                    |                            |                            |
| 200 | 8 - 80                  | 15 - 150             | 10                         | -                          |
|     | 25 - 300                | 20 - 300             |                            |                            |

Min and Max flow-rate for each range according installation, with pressure drop of 20 to 30 mbar depending of the liquide.  
Intermediate measuring ranges are available on request.

\*) : Only with glass window and horizontal installation

## MATERIALS

| Models             | Fitting                  | Flap         | Bearing      | Disc                          | Blind flange / Ring             | Seal      | ND       |
|--------------------|--------------------------|--------------|--------------|-------------------------------|---------------------------------|-----------|----------|
| KLA                | EN-GJL-200               | 1.4571       | 1.4571       | 1.4571                        | EN-GJL-200 / S355               | NBR       | 15 - 150 |
|                    | S355, welded             | 1.4571       | 1.4571       | 1.4571                        | S355                            | NBR       | 200      |
| KLA-V4A            | 1.4571, welded           | 1.4571       | 1.4571       | 1.4571                        | 1.4571                          | FPM       | 25 - 100 |
| KLA-GS             | EN-GJL-200               | 1.4571       | 1.4571       | Soda-lime glass <sup>1)</sup> | S355                            | NBR       | 15 - 25  |
| KLA-GS-V4A         | 1.4571, welded           | 1.4571       | 1.4571       | Borosilicate glass            | 1.4571                          | FPM       | 25 - 100 |
| KLA - Rubber lined | EN-GJL-200<br>+ isoprene | 1.4571       | 1.4571       | 1.4571                        | EN-GJL-200 / S355<br>+ isoprene | Sil-C8200 | 32 - 150 |
|                    |                          | Hastelloy C4 | Hastelloy C4 | 1.4571 - PTFE                 |                                 | Sil-C8200 | 32 - 150 |
|                    |                          | PTFE         | Hastelloy C4 | 1.4571 - PTFE                 |                                 | Sil-C8200 | 80 - 150 |
|                    |                          | PTFE         | PTFE         | 1.4571 - PTFE                 |                                 | Sil-C8200 | 80 - 150 |

Others on request: Seals, cast bronze (CuSn)

<sup>1)</sup> : Option, with borosilicate glass

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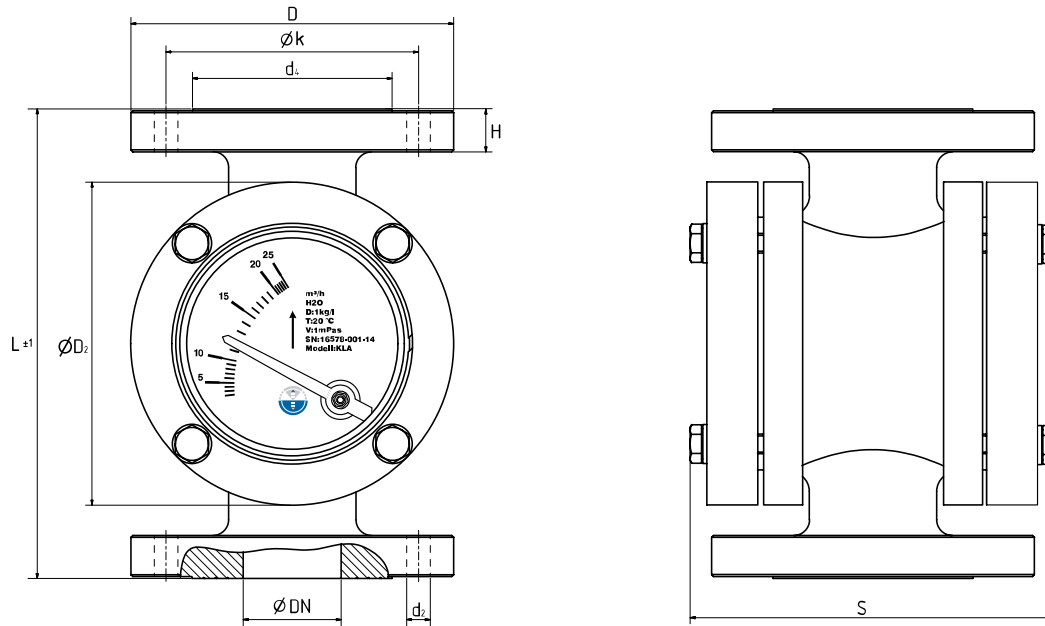
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713-12/3

24-11-2020

D-713.12-EN-AA

## DIMENSIONS



| DN  | Ø D [mm] | Ø k [mm] | Ø d <sub>1</sub> [mm] | Ø H [mm] | L [mm] | Ø D <sub>2</sub> [mm] | d <sub>2</sub> | Screw | S /IK [mm] | GS [mm] | EM [mm] | [kg] |
|-----|----------|----------|-----------------------|----------|--------|-----------------------|----------------|-------|------------|---------|---------|------|
| 15  | 95       | 65       | 45                    | 18       | 170    | 119                   | M12            | x4    | 145        | 132     | 166     | 8    |
| 20  | 105      | 75       | 58                    | 18       | 170    | 119                   | M12            | x4    | 145        | 132     | 166     | 8.5  |
| 25  | 115      | 85       | 68                    | 18       | 170    | 119                   | Ø 14           | x4    | 145        | 132     | 166     | 9    |
| 32  | 140      | 100      | 78                    | 21       | 240    | 165                   | Ø 18           | x4    | 176        | 186     | 197     | 16   |
| 40  | 150      | 110      | 88                    | 21       | 240    | 165                   | Ø 18           | x4    | 176        | 186     | 197     | 16   |
| 50  | 165      | 125      | 102                   | 21       | 240    | 165                   | Ø 18           | x4    | 176        | 186     | 197     | 17   |
| 65  | 185      | 145      | 122                   | 21       | 280    | 185                   | Ø 18           | x4    | 201        | 217     | 222     | 22   |
| 80  | 200      | 160      | 138                   | 22       | 320    | 225                   | Ø 18           | x8    | 214        | 227     | 235     | 34   |
| 100 | 220      | 180      | 158                   | 24       | 350    | 245                   | Ø 18           | x8    | 267        | 278     | 288     | 43   |
| 125 | 250      | 210      | 188                   | 25       | 380    | 285                   | Ø 18           | x8    | 299        | 310     | 320     | 58   |
| 150 | 285      | 240      | 212                   | 25       | 380    | 295                   | Ø 22           | x8    | 299        | 310     | 320     | 64   |
| 200 | 340      | 295      | 268                   | 27       | 550    | 370                   | Ø 22           | x8    | 386        | -       | 407     | 104  |

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## INSTALLATION

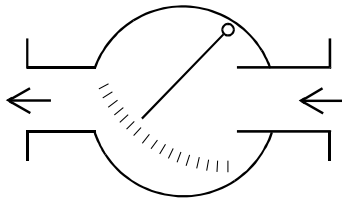
### Mounting:

With the order: flow direction to confirm.

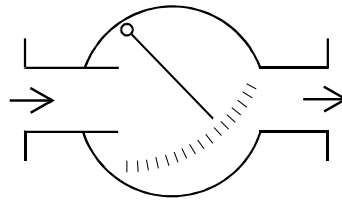
Screws, nuts and gaskets are not supplied.

Respect straight distances: as a minimum 3 times the pipe diameter.

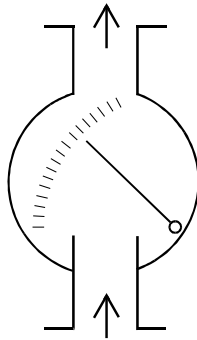
### Flow direction



Right to left



Left to right



Bottom to top

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