# Flexim FLUXUS F401 Ultrasonic Flowmeter



### **Ultrasonic Flowmeter for Water**

Portable, very robust and easy-to-use ultrasonic flowmeter for the water and wastewater industry

#### Features

- · Several months of battery operation possible
- · Very high bidirectional measuring accuracy and highly dynamic flow measurement
- · IP68 transducers, reinforced transducer cables and very robust housing
- · Easy and intuitive use
- Very fast and easy installation
- Permanent coupling foil
- · High measuring accuracy, even at low flow velocities
- · Suitable for highly diverse nominal pipe sizes and pipe materials
- Minimum nightflow mode
- Adherence to AWWA manual M36

#### Applications

- Temporary measurements in the water and wastewater industry
- Leakage detection
- Water loss balancing
- · Accuracy verification of permanently installed flowmeters
- Monitoring of pumping tests





## Transmitter

## Technical data

| principle in the interval of t   |                                    |             | FLUXUS F401  |
|--|------------------------------------|-------------|--|
| measurement of the second seco   | measurement                        |             |  |
| principle princi   | measurement                        | 1           | transit time difference correlation principle  |
| specializity         2.5 % of reading ±0.03 %           huid         water           measurement uncore         2 % of reading ±0.03 %           measurement uncore         2 % of reading ±0.03 %           measurement uncore         100 to 230 V/50 to 60 Fz (power supply unt)           integrated battery         - 100 to 230 V/50 to 60 Fz (power supply unt)           integrated battery         - 100 to 230 V/50 to 60 Fz (power supply unt)           integrated battery         - Whited objusts and backlight, inner pipe diameter max. 55.1 in:           - opperating time   | principle                          |             |  |
| build         water           attry focuration         attry focuration           over rapping         attry focuration           over rapping         - 100 to 230 WS0 to 60 Hz (power suppy unit)           over rapping         - 100 to 100 to 230 WS0 to 60 Hz (power suppy unit)           over rapping         - 100 to 100 to 230 WS0 to 60 Hz (power suppy unit)           over rapping         - 100 to 100 to 230 WS0 to 60 Hz (power suppy unit)           over rapping         - 0 ontinuous measurement - 40 h           - ontinuous measurement - 40 h         - ontinuous measurement - 40 h           - ontinuous measurement - 40 h         - ontinuous measurement - 40 h           - > 7 d (measuring interval to min)         - > 30 d (the continuous measurement per 24 h)           - > > 3 d (rapsaring interval to min)         - > 30 d (the continuous measurement per 24 h)           - > > 4 d (the continuous measurement per 24 h)         - > 3 d (the continuous measurement)           - > 1 d (the continuous measurement)         - > 1 d (the continuous measurement)           - > 1 d (the continuous measurement)         - > 1 d (the continuous measurement)           - > 1 d (the continuous measurement)         - > 1 d (the continuous measurement)           - > 1 d (the continuous measurement)         - > 1 d (the continuous measurement)           - > - > - > - > - > - > - > - > - > -  | flow velocity                      | ft/s        | 0.03 to 82   |
| measurement uncer<br>ainty (volumetric<br>for rate)<br>town apply  | repeatability                      |             | 0.25 % of reading ±0.03 ft/s   |
| alinky tooknetic<br>over rate/<br>Framewite<br>cover supply<br>e operating line<br>+ 101 to 250 1/50 to 80 H2 (power supply unit)<br>+ 101 to 250 1/50 to 80 H2 (power supply unit)<br>+ 101 to 250 1/50 to 80 H2 (power supply unit)<br>+ 101 to 250 1/50 to 80 H2 (power supply unit)<br>+ 100 to 100 topics and backlight, inner pied dander max, 55 t in:<br>+ continuous measurement > 48 h<br>+ low power mode:<br>- > 7 of (measuring interval; 10 min)<br>- > 30 of (measuring interval; 10 min)<br>- > 30 of (measuring interval; 10 min)<br>- > > 30 of (measuring interval; 10 min)<br>- > > 30 of (measuring interval; 10 min)<br>- > > > > > > > > > > > > > > > > > > >  | fluid                              | ĺ           | water  |
| too in also         Image:   | measurement uncer-                 |             | ±2 % of reading ±0.03 ft/s   |
| intersection              • 100 to 230 V/50 to 60 Hz (power supply unit)             • 103 to 230 V/50 to 60 Hz (power supply unit)             • 103 to 230 V/50 to 60 Hz (power supply unit)             • integrated battery             • 103 to 230 V/50 to 60 Hz (power supply unit)             • integrated battery             • Integrated battery             • Ul-loa             • integrated battery             • Ul-loa             • operating time             • op   |                                    |             |  |
| prover supply              • 100 to 230 V/50 to 60 Hz (power supply unit)             • 10, to 10 to 230 V/50 to 60 Hz (power supply unit)             • 10, to 10 V CC (solvet at at inneximiter)             • integrated battery             • continuous measurement > 48 h             • continuous measurement > 48 h             • low power mode:  | ,                                  |             |  |
| integrated battery     integrated battery       integrated battery     integrated battery <td></td> <td>r –</td> <td></td>   |                                    | r –         |  |
| integrated batiesy         integrated batiesy           integrated batiesy <td>power supply</td> <td></td> <td></td>   | power supply                       |             |  |
| nitegrated battery<br>operating time   |                                    |             |  |
| • operating time ' without outputs and backlight, inner pipe diameter max. 55.1 in: • continuous measurement > 48.h • continuous measurement > 48.h • continuous measurement > 48.h • continuous measurement a pi 24.h) - > 70 d (measuring intervai: 0 min) - > 100 d (measuring intervai: 0 min) - > 100 d (measuring intervai: 0 min) - > 100 d (neasuring intervai: 0 min) - > 100 d (1 h continuous measurement per 24.h) - > 0.0 d (2 h continuous measurement per 24.h) - > 0.0 d (2 h continuous measurement) - + 1.s (0 h (20) duitable, continuous measurement) - + 1.s (0 h (20) duitable, continuous measurement) - + 1.s (0 h (20) duitable, continuous measurement) - + masuring intervai - + 1.s (0 h (20) duitable, continuous measurement) - + max.h (2 h continuous measurement) - + fux.Claig (continuous measurement) - + fux.Claig (continuous m   |                                    |             |  |
| continuous measurement: > 48 h     iow prover mode:        > 7 d (measuring interval: 10 min)        > 7 d (measuring interval: 00 min)        > 7 d (d neasuring interval: 00 min)        > 80 d (d neasuring interval: 00 min)        > 80 d (d h continuous measurement) per 24 h)        > 80 d (2 h continuous measurement) per 24 h)        > 80 d (2 h continuous measurement)        > 80 d (2 h continuous measur   |                                    |             |  |
| sets         - > 10 (measuring interval: 1 min)           -> > 30 (measuring interval: 0 min)           -> > 10 (measuring interval: 0 min)           -> > > > > > > > > > > > > > > > > > >   | <ul> <li>operating time</li> </ul> |             |  |
| set of (measuring interval: 10 min)         -> 50 d (measuring interval: 50 min)         -> 810 d (f h continuous measurement per 24 h)         -> 80 d (f h continuous measurement per 24 h)         -> 80 d (f h continuous measurement per 24 h)         -> 80 d (f h continuous measurement)         damping       s         1         feasuring cylic         atmping       s         0 h 100 (adjustable, continuous measurement)         measuring cylic       1         interval       + 1 s (continuous measurement)         measuring cylic       + 1 s (continuous measurement)         neasuring cylic       + 1 s (continuous measurement)         neasuring cylic       NEMA 6 (housing cover closed)         housing material       NEMA 6 (housing cover closed)         housing material       NEMA 6 (housing cover closed)         NEMA 6 (housing cover closed)       NEMA 6 (housing cover closed)         housing material       volumetric flow rate, mass flow rate, flow velocity         atopiet       2 k 10 contacters, dot matin, backlight         cervice       + 1 S (So   |                                    |             |  |
| self     -> 30 d (measuring interval: 0 min)       -> 270 d (measuring interval: 0 min)       -> 270 d (measuring interval: 0 min)       -> 14 d (A nontinuous measurement per 24 h)       -> 0.00 d (nontinuous measurement)       measuring interval       -> 1.1 f (0.00 d (nutatable, continuous measurement)       measuring interval       -> 1.1 f (0.00 d (nutatable, continuous measurement)       measuring interval       -> 1.1 f (0.00 d (nutatable, continuous measurement)       measuring interval       -> 1.1 f (0.00 d (nutatable, continuous measurement)       measuring interval       PP       PM       + 1.5 (no 1.15, 30, 60 min (nov power mode)       + max, 1.2 nontinuous measurement)       measuring interval       NEMA 4 (housing cover open)       NEMA 4 (housing cover open)       NEMA 4 (housing cover open)       Nema 1.1 f (0.75 x 0.00 min (nov power mode)       - measuring interval       Velumentic flow rate, mon flow rate, flow velocity       Udinentic flow rate, mas flow rate, flow velocity       Udinentic flow rate, mas flow rate, flow velocity  |                                    |             |  |
| selection         -> 180 of (measuring interval: 80 min)           -> 270 of (measuring interval: 80 min)           -> 30 of (2) hootinuous measurement per 24 h)           -> 30 of (2) hootinuous measurement per 24 h)           -> 30 of (2) hootinuous measurement per 24 h)           -> 30 of (2) hootinuous measurement per 24 h)           -> 40 of (1) hootinuous measurement per 24 h)           -> 40 of (1) hootinuous measurement per 24 h)           -> 41 of (1) hootinuous measurement per 24 h)           -> 41 of (1) hootinuous measurement per 24 h)           -> 41 of (1) hootinuous measurement per 24 h)           -> 41 of (1) hootinuous measurement per 24 h)           -> 41 of (1) hootinuous measurement per 24 h)           -> 41 of (1) hootinuous measurement per 24 h (minimum nightflow mode)           +> 15, 10, 15, 30, 60 min (low power mode)           + nakar 12 hootinuous measurement per 24 h (minimum nightflow mode)           PP           Provide A (housing cover closed)           NEMA 4 (housing co  |                                    |             |  |
| second         -> 270 d (messuring) interval: 60 min)           • minitum mightfow mode:         -> 14 d (A for continuous measurement per 24 h)           -> 60 d (I h continuous measurement per 24 h)         -> 60 d (I h continuous measurement per 24 h)           -> 60 d (I h continuous measurement per 24 h)         -> 60 d (I h continuous measurement per 24 h)           -> 60 d (I h continuous measurement per 24 h)         -> 60 d (I h continuous measurement)           tamping or le         1           tamping or le         14           tages of protection         NEMA 8 (housing cover open)           tamping functions         16 d a 3 x 72 x 5           tamping functions         16 d a 3 x 72 x 5           tamping functions         14 + 122           tapping functions         14 + 122           tapping functions         14 + 122           tapping functions         14 + 8232           tapping functions         14 + 8232           tapping functions         18 + 8232   |                                    |             |  |
| * minimum injettiow mode:         - • • 14 (4 h continuous measurement per 24 h)         - • 50 d (2 h continuous measurement per 24 h)         - • 50 d (2 h continuous measurement per 24 h)         - • 50 d (2 h continuous measurement per 24 h)         - • 60 d (1 h continuous measurement)         - • 60 d (1 h cont   |                                    |             |  |
|  |                                    |             |  |
| > 30 d (2 h continuous measurement per 24 h)           -> 60 d (1 h continuous measurement per 24 h)           channels         1           channels         0           atmping         0         1           channels         1           atmping         0         1           atmping         0         1           atmping         0         1           atmping         1         1           atmping  |                                    |             |  |
| power consumption W < 3_0. charging: 18<br>interval of the set of th   |                                    |             |  |
| 1       0         damping       s         1       0         measuring optimization       s         1       1         resulting optimization       1         1         resulting  |                                    |             | - > 60 d (1 h continuous measurement per 24 h)   |
| channels         I         I of 100 (adjustable, continuous measurement)           measuring cycle         Hz         10           measuring interval         I of (continuous measurement)         1, 5, 10, 15, 30, 60 min (low power mode)           - max. 12 h continuous measurement per 24 h (minimum nightflow mode)         -           digree of protection         NEMA 6 (housing cover open)           dimensions         in         10.75 x 9.72 x 5           weight         b         6.3           ambient temperature         F1         14 to +122           dinaresions         in contact, so that is, backlight           menu language         English, Geman, French, Dutch, Spanish           measuring function         volumetric flow rate, mass flow rate, flow velocity           totalizer         volumetric flow rate, mass flow rate, flow velocity           totalizer         volumetric flow velocity           service interfaces         - KS232           service interfaces         - VSB (with adapter)           accessories         - USB (with adapter)           acdapter         Notional measured values and parameters, graphical presentation           - FiluxDiagReader: download of measured values and parameters, graphical presentation           - FiluxDiagReader: download of measured values         10 contalia (agget)   | power consumption                  | W           | < 3, charging: 18  |
| damping s 0 to 100 (adjustable, continuous measurement)<br>measuring cycle<br>measuring cycle<br>measuring pinterval<br>s 1 s (continuous measurement)<br>+ 1 s (continuous measurement)<br>+ 1 s (continuous measurement)<br>+ 1 s (continuous measurement per 24 h (minimum nightflow mode)<br>+ max. 12 h continuous measurement per 24 h (minimum nightflow mode)<br>PP<br>Gegree of protection<br>in 10.7s s /2 x 5<br>b (b k k k (housing cover closed)<br>NEMA 4 (housing | number of measuring                |             | 1  |
| measuring interval measuring in  |                                    |             |  |
| measuring interval       + 1 s (continuous measurement)         + 1, 5, 10, 15, 30, 60 min (low power mode)         housing material       PP         digree of protection       NEMA 6 (housing cover closed)         Minemsions       In 10, 75, 9, 72, x 5         adigree of protection       N EMA 4 (housing cover closed)         NEMA 4 (housing cover closed)       NEMA 4 (housing cover closed)         weight       h 6, 8         ambient temperature       FF 14 to +122         display       2 x 16 characters, dot matrix, backlight         mean language       English. German, French, Dutch, Spanish         measuring functions       volume, mass         physical quantities       volume, mass         outlazer       volume, mass         coressories       • USB (with adapter)         accessories       • USB (with adapter)         accessories       • Sta22 - USB         evide Interfaces       • FluxDiag Reader: download of measured values and parameters, graphical presentation         + 1 fourbulag (optional)       fourbulag (adapter)         adapter       output adapter (optional)         diata ligt       • FluxDiag (adapter: download of measured values and parameters, graphical presentation         + FluxDiag (optional)       • FluxDiag (adapter: download of measure  |                                    |             |  |
| • 1, 5, 10, 15, 30, 60 min (low power mode)         + max. 12 h continuous measurement per 24 h (minimum nightflow mode)         housing material       PP         degree of protection       NEMA 6 (housing cover closed)         NEMA 6 (housing cover open)       NEMA 6 (housing cover open)         dimensions       in         in 10.75 x 9.72 x 5       state         ambient temperature [F]       14 to +122         display       2 x 16 characters, dot matrix, backlight         menu language       English, German, French, Dutch, Spanish         measuring functions       volume, mass         physical quantities       volume, mass         communication Interfaces       • RS232         excessories       • USB (with adapter)         accessories       • SE322         e adapter       e RS232 · USB         software       • FluxDiag (coptional)         e adapter       • SE322         output adapter (optional)       contuol adapter (optional)         gagabit values       all physical quantities and totalized values         adapter       all physical quantities and totalized values         cacele       all physical quantities and totalized values         cacele       all physical quantities and totalized values         cap  |                                    | Hz          |  |
| max. 12 nontinuous measurement per 24 h (minimum nightflow mode)           housing material         P           degree of protection         NEMA 6 (housing cover closed)<br>NEMA 4 (housing cover closed)<br>NEMA 4 (housing cover closed)<br>NEMA 4 (housing cover closed)           dimensions         in         10.75 x 9.72 x 5           ambient temperature         F         14 to 122           display         2 x 16 characters, dot matrix, backlight           menu language         English, German, French, Dutch, Spanish           measuring functions         volume, mass           physical quantities         volume, mass           service interfaces         i A S232           accessories         - SE322           accessories         - SE322           accessories         - SE322           adapter         - Se323 - USB           software         - FluxDiag (optional): download of measured values and parameters, graphical presentation, report generation           - Adapter         - Voluput adapter (optional): download of measured values           adapter         - Output adapter (optional): download of measured values           adapter         - Output adapter (optional): download of measurement data, graphical presentation, report generation           - The outputs are galvanically isolated from the transmitter.           adapter         -  | measuring interval                 |             |  |
| bousing material         PP           degree of protection         NEMA 6 (housing cover closed)           Memaions         in         10.75 x 9.72 x 5           weight         b         6.8           ambient temperature         F         14 to +122           display         2 x 16 characters, dot matrix, backlight           measuing functions         in 6.75 x 9.72 x 5           physical quantities         Volumetric flow rate, mass flow rate, flow velocity           volume.measuing functions         volume.mass           physical quantities         Volumetric flow rate, mass flow rate, flow velocity           volume, mass         volume, mass           communication interfaces         • RS232           service interfaces         • USB (with adapter)           accessories         • UsB (with adapter)           accessories         • UsB (with adapter)           software         • FluxDiag (optional)           calpter         optional           adapter         optional           dagter         optional)           dagter         optional           dagter         intubiagRead: download of measured values and parameters, graphical presentation           etail dagg         FluxDiag (optional): download of measured values  |                                    |             |  |
| degree of protection         NEMA 6 (housing cover open)           dimensions         in         10.75 x 9.72 x 5           weight         b         6.8           ambient temperature         F         14 to +122           display         2 x 16 characters, dot matrix, backlight           menu language         English, German, French, Dutch, Spanish           measuring functions         volumetric flow rate, mass flow rate, flow velocity           otalizer         volume, mass           service interfaces         • RS232           service interfaces         • USB (with adapter)           accessories         • USB (with adapter)           accessories         • FluxDiagReader: download of measured values and parameters, graphical presentation           • FluxDiag optional): download of measured values and parameters, graphical presentation           • FluxDiag optional): download of measured values and parameters, graphical presentation           • FluxDiag optional): download of measured values           adapter         output adapter (optional)           output adapter (optional)           data logger           oggable values         all physical quantities and totalized values           capacity         > 100 000 measured values           output adapter (optional)         ft at o 20 (to 22)  |                                    |             |  |
| NEMA 4 (housing cover open)           dimensions         in         10.75 x 9.72 x 5           weight         ib         6.8           ambient temperature         F         14 to +122           ambient temperature         F         14 to +122           ambient temperature         F         14 to +122           measuing functions         English, German, French, Dutch, Spanish           measuing functions         volume: mass           physical quantities         volume: mass           communication interfaces         -           service interfaces         -           e- NSS (with adapter)         accessories           service interfaces         -           e- oblate         RS232           a dapter         Aps232           a dapter         PluxDiag (optional): download of measured values and parameters, graphical presentation           adapter         optional: download of measured values           adapter         optional: download of measured values           output adapter (optional): download of measured values           output adapter (optional): download of measurement data, graphical presentation           e- fluxDiag (optional): download of measurement data, graphical presentation           adapter         output adapter (optional): download  |                                    |             |  |
| dimensions       in       10.75 x 9.72 x 5         weight       b       6.8         ambient temperature       F       14 to +122         2 x 16 characters, dot matrix, backlight  | degree of protection               |             |  |
| weight         bb         6.8           ambient temperature         *F         14 to +122           ambient temperature         *F         14 to +122           sigplay         2 x 16 characters, dot matrix, backlight   | dimensione                         |             |  |
| ambient temperature       "F       14 to +122         display       2 x 16 characters, dot matrix, backlight         meanu language       English, German, French, Dutch, Spanish         measuring functions       volume, mass         physical quantities       volume, mass         communication interfaces       • RS232         service interfaces       • RS232         service interfaces       • USB (with adapter)         accessories       service interfaces         service interfaces       • S232 - USB         software       RS232 - USB         adapter       RS232 - USB         adapter       optional         data fogger       -         loggable values       all physical quantities and totalized values         capacity       > 10 0000 measured values         output       apter dupter dupter (optional)         range       1 (continuous measurement)         accuracy       0 1% of reading ±15 µA         passive output       U <sub>wat</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   |                                    |             |  |
| display 2 x 16 characters, dot matrix, backlight<br>menu language English, German, French, Dutch, Spanish<br>measuring functions<br>physical quantities volume tria flow rate, mass flow rate, flow velocity<br>totalazer volume, mass<br>communication interfaces<br>service interfaces • RS232<br>• RS232<br>• USB (with adapter)<br>accessories<br>serial data kit optional<br>• cable RS232 · USB<br>software FluxDiag Reader. download of measured values and parameters, graphical presentation<br>• FluxDiag (optional)<br>• cable RS232 · USB<br>software • FluxDiag Reader. download of measured values and parameters, graphical presentation<br>• FluxDiag (optional)<br>• data togger<br>todga be values a alphysical quantities and totalized values<br>adapter 0 output adapter (optional)<br>• data togger<br>toggable values a alphysical quantities and totalized values<br>software • I fluxDiag quantities and totalized values<br>outputs • 100 000 measured values<br>outputs are galvanically isolated from the transmitter.<br>• current output<br>number 1 (continuous measurement)<br>range mA { 4 to 20 (to 12 2)<br>accuracy 0, 1 % of reading ±15 µA<br>passive output U<br>binary output as palar<br>• binary output<br>• functions 1 (continuous measurement)<br>optorelay 2 20 /2000 mA<br>binary output as palar<br>• functions 1 [imit or error<br>binary output as aliam output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• functions 1 [imit or error<br>binary output as palies output<br>• function  |                                    |             |  |
| measuring functions         English, German, French, Dutch, Spanish           measuring functions         Formations           hysical quantities         Volumetric flow rate, mass flow rate, flow velocity           totalizer         Volume, mass           communication interfaces              • RS232             • USB (with adapter)            accessories              • USB (with adapter)            accessories              • Service interfaces            software              • FluxDiagReader: download of measured values and parameters, graphical presentation            adapter         output adapter (optional)           data logger             loggable values         I all physical quantities and totalized values           adapter         output adapter (optional)           data logger             loggable values         I all physical quantities and totalized values           capacity         > 100 000 measured values           output adapter (optional)             mumber             The outputs are galvanically isolated from the transmitter.           current output             number             1 (continuous measurement)  |                                    |             |  |
| measuring functions         volumetric flow rate, mass flow rate, flow velocity           physical quantities         volume, mass           communication interfaces         • RS232           service interfaces         • USB (with adapter)           accessories         • USB (with adapter)           accessories         • FluxDiagReader: download of measured values and parameters, graphical presentation           • FluxDiag (optional): download of measured values and parameters, graphical presentation           • FluxDiag (optional): download of measurement data, graphical presentation           • FluxDiag (optional): download of measurement data, graphical presentation           • FluxDiag (optional): download of measurement data, graphical presentation           • FluxDiag (optional): download of measurement data, graphical presentation           • FluxDiag (optional): download of measurement data, graphical presentation           • FluxDiag (optional): download of measurement data, graphical presentation           • Job 0000 measured values           outputs           Import           In the outputs are galvanically isolated from the transmitter.           • current output           number           In (continuous measurement)           range           massive output           Uext = 4 to 24 V, depending on Rext (Rext < 1 kΩ at 24 V)  |                                    |             |  |
| physical quantities   volumetric flow rate, mass flow rate, flow velocity   volume, mass<br>communication interfaces   • R5232   • USB (with adapter)<br>accessories<br>service interfaces   • R5232   • USB (with adapter)<br>accessories<br>servia data kit   optional   R5232   VSB   R524   VSB   R524   VSB   VS  |                                    |             | English, Cerman, French, Dator, Opanish  |
| initializer         volume, mass           communication interfaces         • RS232           service interfaces         • RS232           • USB (with adapter)         accessories           accessories         • FluxDiag Reader: download of measured values and parameters, graphical presentation           • cable         RS232 - USB           adapter         RS232 - USB           software         • FluxDiag Reader: download of measured values and parameters, graphical presentation           • FluxDiag (optional): download of measurement data, graphical presentation           • FluxDiag (optional): download of measurement data, graphical presentation, report generation           adapter         output adapter (optional)           data logger         output adapter (optional)           loggable values         all physical quantities and totalized values           capacity         > 100 000 measured values           output         > 100 outputs are galvanically isolated from the transmitter.           • current output         1 (continuous measurement)           range         mA           accuracy         0.1 % of reading ±15 µA           passive output         U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)  | -                                  |             | volumetric flow rate, mass flow rate, flow velocity  |
| communication interfaces         • RS232           service interfaces         • USB (with adapter)           accessories         • USB (with adapter)           serial data kit         optional           • cable         RS232           • adapter         RS232 - USB           software         • FluxDiagReader: download of measured values and parameters, graphical presentation           • FluxDiag (optional): download of measurement data, graphical presentation, report generation           adapter         output adapter (optional)           data logger         output adapter (optional)           oggable values         all physical quantities and totalized values           capacity         > 100 000 measured values           outputs         The outputs are galvanically isolated from the transmitter.           • current output         1 (continuous measurement)           namber         1 (continuous measurement)           accuracy         0.1 % of reading ±15 µA           passive output         Uext = 4 to 24 V, depending on Rext (Rext < 1 kΩ at 24 V)   | totalizer                          |             | , , ,  |
| • USB (with adapter)           accessories           serial data kit         optional<br>RS232           • cable         RS232           • adapter         RS232           • adapter         RS232           • FluxDiagReader: download of measured values and parameters, graphical presentation<br>• FluxDiag (optional): download of measurement data, graphical presentation, report generation           adapter         output adapter (optional)           data logger         output adapter (optional)           loggable values         all physical quantities and totalized values           capacity         > 100 000 measured values           capacity         > 100 continuous measurement)           range         mA         4 to 20 (0 to 22)           accuracy         0.1 % of reading ±15 μA           passive output         Uest = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)  | communication inte                 | rface       |  |
| accessories       optional         serial data kit       optional         • cable       RS232         • adapter       RS232 - USB         software       • FluxDiagReader: download of measured values and parameters, graphical presentation         • Adapter       output adapter (optional): download of measurement data, graphical presentation, report generation         adapter       output adapter (optional)         data logger       output adapter (optional)         loggable values       all physical quantities and totalized values         capacity       > 100 000 measured values         output       The outputs are galvanically isolated from the transmitter.         • current output       I (continuous measurement)         range       mA         4 to 20 (0 to 22)         accuracy       0.1 % of reading ±15 µA         passive output       U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   | service interfaces                 |             | • R\$232   |
| accessories       optional         serial data kit       optional         • cable       RS232         • adapter       RS232 - USB         software       • FluxDiagReader: download of measured values and parameters, graphical presentation         • Adapter       output adapter (optional): download of measurement data, graphical presentation, report generation         adapter       output adapter (optional)         data logger       output adapter (optional)         loggable values       all physical quantities and totalized values         capacity       > 100 000 measured values         output       The outputs are galvanically isolated from the transmitter.         • current output       I (continuous measurement)         range       mA         4 to 20 (0 to 22)         accuracy       0.1 % of reading ±15 µA         passive output       U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   |                                    |             | USB (with adapter)   |
| cable         RS232<br>RS232 - USB           software         FluxDiagReader: download of measured values and parameters, graphical presentation<br>- FluxDiag (optional): download of measurement data, graphical presentation, report generation           adapter         output adapter (optional)           data logger         output adapter (optional)           data logger         intervention           loggable values         all physical quantities and totalized values           capacity         > 100 000 measured values           outputs         -           outputs         -           outputs         -           number         1 (continuous measurement)           range         mA           4 to 20 (to 22)           accuracy         0.1 % of reading ±15 µA           passive output         U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   | accessories                        |             |  |
| cable         RS232<br>RS232 - USB           software         FluxDiagReader: download of measured values and parameters, graphical presentation<br>- FluxDiag (optional): download of measurement data, graphical presentation, report generation           adapter         output adapter (optional)           data logger         output adapter (optional)           data logger         intervention           loggable values         all physical quantities and totalized values           capacity         > 100 000 measured values           outputs         -           outputs         -           outputs         -           number         1 (continuous measurement)           range         mA           4 to 20 (to 22)           accuracy         0.1 % of reading ±15 µA           passive output         U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   |                                    | [           | optional   |
| • adapter         RS232 - USB           software         • FluxDiagReader: download of measured values and parameters, graphical presentation           • adapter         output adapter (optional)           data logger         output adapter (optional)           data logger         all physical quantities and totalized values           capacity         > 100 000 measured values           outputs         > 100 000 measured values           capacity         > 100 000 measured values           outputs         -           carrent output         The outputs are galvanically isolated from the transmitter.           • current output         -           number         1 (continuous measurement)           range         MA 4 to 20 (to 22)           accuracy         0.1 % of reading ±15 µA           passive output         U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)  |                                    |             |  |
| software <ul> <li>FluxDiagReader: download of measured values and parameters, graphical presentation</li> <li>FluxDiag (optional): download of measurement data, graphical presentation, report generation</li> </ul> adapter       output adapter (optional):         download of measurement data, graphical presentation, report generation         adapter       output adapter (optional)         dota logger <ul> <li>all physical quantities and totalized values</li> <li>capacity</li> <li>&gt; 100 000 measured values</li> </ul> capacity       > 100 000 measured values         outputs            current output <ul> <li>The outputs measurement)</li> <li>range</li> <li>mA 4 to 20 (0 to 22)</li> <li>accuracy</li> <li>0.1 % of reading ±15 µA</li> <li>passive output</li> <li>Uext = 4 to 24 V, depending on R<sub>ext</sub> (R<sub>ext</sub> &lt; 1 kΩ at 24 V)</li> </ul> • binary output         optorelay       32 V/200 mA         oinary output as alarm output         • functions <ul> <li>limit or error</li> <li>binary output as alles output</li> <li>output</li> <li>output</li> <li>solue</li> <li>units</li> <li>0.01 to 1000</li> <li>pulse width</li> <li>mainly for totalizing</li> <li>pulse width</li> <li>mainly for totalizing</li></ul>   |                                    |             |  |
| adapter       output adapter (optional)         data logger         loggable values       all physical quantities and totalized values         capacity       > 100 000 measured values         outputs       The outputs are galvanically isolated from the transmitter.         • current output       Inte outputs are galvanically isolated from the transmitter.         • current output       1 (continuous measurement)         nange       mA 4 to 20 (0 to 22)         accuracy       0.1 % of reading ±15 µA         passive output       U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   | software                           | Ì           | FluxDiagReader: download of measured values and parameters, graphical presentation                               |
| data logger       all physical quantities and totalized values         capacity       > 100 000 measured values         outputs       The outputs are galvanically isolated from the transmitter.         • current output       The outputs are galvanically isolated from the transmitter.         • current output       1 (continuous measurement)         number       1 (continuous measurement)         range       mA         accuracy       0.1 % of reading ±15 µA         passive output       Uext = 4 to 24 V, depending on Rext (Rext < 1 kΩ at 24 V)  |                                    |             | <ul> <li>FluxDiag (optional): download of measurement data, graphical presentation, report generation</li> </ul> |
| loggable values       all physical quantities and totalized values         capacity       > 100 000 measured values         outputs       The outputs are galvanically isolated from the transmitter.         • current output       In (continuous measurement)         number       1 (continuous measurement)         range       mA         4 to 20 (0 to 22)         accuracy       0.1 % of reading ±15 µA         passive output       U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)  | adapter                            | ĺ           | output adapter (optional)  |
| capacity       > 100 000 measured values         outputs       The outputs are galvanically isolated from the transmitter.         • current output       Incontinuous measurement)         number       1 (continuous measurement)         range       mA         accuracy       0.1 % of reading ±15 µA         passive output       Uext = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   | data logger                        |             |  |
| The outputs are galvanically isolated from the transmitter.         • current output         number       1 (continuous measurement)         range       mA       4 to 20 (0 to 22)         accuracy       0.1 % of reading ±15 µA         passive output       U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)  | loggable values                    |             |  |
| The outputs are galvanically isolated from the transmitter.         • current output         number       1 (continuous measurement)         range       mA       4 to 20 (0 to 22)         accuracy       0.1 % of reading ±15 µA         passive output       U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)  | capacity                           |             | > 100 000 measured values  |
| • current output         1 (continuous measurement)           number         1 (continuous measurement)           range         mA         4 to 20 (0 to 22)           accuracy         0.1 % of reading ±15 µA           passive output         U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   | outputs                            |             |  |
| number       1 (continuous measurement)         range       mA       4 to 20 (0 to 22)         accuracy       0.1 % of reading ±15 μA         passive output       U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   |                                    |             | The outputs are galvanically isolated from the transmitter.  |
| range       mA       4 to 20 (0 to 22)         accuracy       0.1 % of reading ±15 μA         passive output       U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   |                                    |             |  |
| accuracy       0.1 % of reading ±15 μA         passive output       U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)  | number                             |             |  |
| passive output       U <sub>ext</sub> = 4 to 24 V, depending on R <sub>ext</sub> (R <sub>ext</sub> < 1 kΩ at 24 V)   | range                              | mΑ          |  |
| binary output     in the final second s  | accuracy                           | ļ           |  |
| number       1 (continuous measurement)         optorelay       32 V/200 mA         binary output as alarm output         • functions       limit or error         binary output as pulse output         • functions       mainly for totalizing         • pulse value       units         0.01 to 1000         • pulse width       ms         80 to 1000  |                                    |             | $U_{ext}$ = 4 to 24 V, depending on $R_{ext}$ ( $R_{ext}$ < 1 k $\Omega$ at 24 V)                                |
| optorelay     32 V/200 mA       binary output as alarm output       • functions      limit or error       binary output as pulse output       • functions     mainly for totalizing       • pulse value     units       0.01 to 1000       • pulse width     ms       80 to 1000   |                                    | 1           |  |
| binary output as alarm output<br>functions   limit or error<br>binary output as pulse output<br>functions   mainly for totalizing<br>pulse value units 0.01 to 1000<br>pulse width ms 80 to 1000   |                                    |             |  |
| functions   limit or error binary output as pulse output     functions   mainly for totalizing     pulse value units 0.01 to 1000     pulse width ms 80 to 1000  |                                    |             |  |
| binary output as pulse output<br>functions   mainly for totalizing<br>pulse value units 0.01 to 1000<br>pulse width ms 80 to 1000  |                                    | n outp<br>I |  |
| functions     mainly for totalizing       pulse value     units       pulse width     ms       80 to 1000  |                                    |             |  |
| pulse value units 0.01 to 1000     pulse width ms 80 to 1000   |                                    | = outp      |  |
| pulse width ms 80 to 1000  |                                    | 110.4-      |  |
|  |                                    |             |  |
|  | <u> </u>                           |             |  |

<sup>1</sup> for reference conditions and v > 0.82 ft/s

## Connection

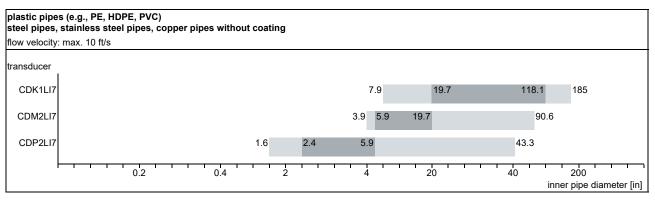
# FLUXUS F401 В D С ₿ transducers power supply unit/ battery charging unit outputs or power pack binary output $\odot$ + current output $\odot$ output adapter

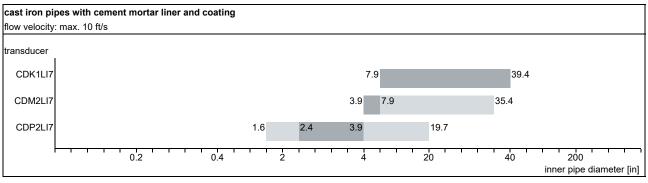
#### Output adapter

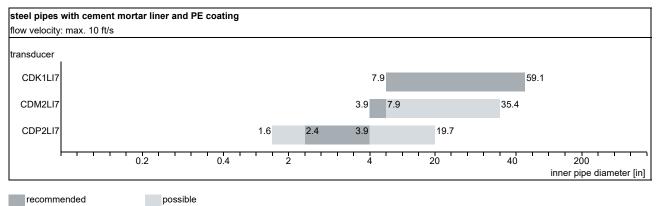
| pin | connection         |
|-----|--------------------|
| A   | binary output (+)  |
| В   | binary output (-)  |
| С   | current output (+) |
| D   | current output (-) |

# Transducers

## Transducer recommendation for typical water pipe materials







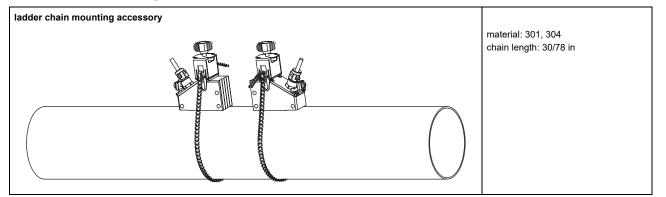
For other pipe materials and higher flow velocities please contact FLEXIM.

#### **Technical data**

| order code                |     | FSK-NNNNL/IP68      | FSM-NNNNL/IP68  | FSP-NNNNL/IP68 |
|---------------------------|-----|---------------------|-----------------|----------------|
| technical type            |     | CDK1LI7             | CDM2LI7         | CDP2LI7        |
| transducer frequency      | MHz | 0.5                 | 1               | 2              |
| inner pipe diameter       |     | see transducer reco | mmendation      | •              |
| pipe wall thickness       |     |                     |                 |                |
| min.                      | in  | 0.2                 | 0.1             | 0.05           |
| material                  |     |                     |                 | •              |
| housing                   |     | PEEK with stainless | steel cap 316Ti |                |
| contact surface           | Ì   | PEEK                |                 |                |
| degree of protection      |     | IP68 <sup>1</sup>   |                 |                |
| transducer cable          |     |                     |                 |                |
| type                      |     | 7819                |                 |                |
| length                    | ft  | 19                  |                 |                |
| dimensions                |     | •                   |                 |                |
| length I                  | in  | 5.12                | 2.76            |                |
| width b                   | in  | 2.13                | 1.26            |                |
| height h                  | in  | 3.29                | 1.81            |                |
| dimensional drawing       |     |                     |                 |                |
| weight (without<br>cable) | lb  | 0.95                | 0.19            |                |
| pipe surface temper       |     |                     |                 |                |
| min.                      | °F  | -40                 |                 |                |
| max.                      | °F  | +212                |                 |                |
| ambient temperatur        | e   |                     |                 |                |
| min.                      | °F  | -40                 |                 |                |
| max.                      | °F  | +212                |                 |                |

<sup>1</sup> test conditions: 3 months/29 psi (65 ft)/36 °F

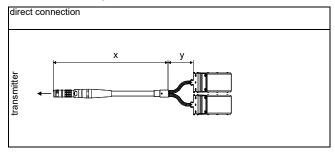
#### Transducer mounting fixture



## Coupling materials for transducers

| type                     | ambient temperature |
|--------------------------|---------------------|
|                          | °F                  |
| coupling pad type VT     | 14 to +392          |
| coupling compound type E | -22 to +392         |

#### **Connection systems**



#### Cable

| transducer cable    |    |                       |  |  |  |  |
|---------------------|----|-----------------------|--|--|--|--|
| type                |    | 7819                  |  |  |  |  |
| length              | ft | x, y: 9.5             |  |  |  |  |
| ambient temperature | °F | -40 to +212           |  |  |  |  |
| cable jacket        |    |                       |  |  |  |  |
| material            |    | PUR                   |  |  |  |  |
| outer diameter      | in | 0.2 ±0.01             |  |  |  |  |
| thickness           | in | 0.04                  |  |  |  |  |
| color               | ĺ  | gray                  |  |  |  |  |
| shield              | ĺ  | x                     |  |  |  |  |
| sheath x            |    | -                     |  |  |  |  |
| material            |    | PUR                   |  |  |  |  |
| outer diameter      | in | 0.51 ±0.02            |  |  |  |  |
| color               | ĺ  | gray                  |  |  |  |  |
| sheath y            |    |                       |  |  |  |  |
| material            |    | stainless steel 316Ti |  |  |  |  |
| outer diameter      |    | 0.31                  |  |  |  |  |
| connector           | •  | -                     |  |  |  |  |
| type                |    | Lemo 3K               |  |  |  |  |

For more information: **Emerson.com** 

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