

# AMFLO<sup>®</sup> SONIC UFA 280

## Ultrasonic flow measuring equipment

### Usage

Ultrasonic flowmeter to be combined with calculators for heat and cooling measurement. The primary uses are for flow measurement in the fields of cooling, building automation, cooling water and cold water.



### Features

- Two-track ultrasound measuring principle
- DN 50 – DN 1200
- Medium temperature 2-120°C (150°C)
- Measuring accuracy  $\pm 0.5\%$

### Customer benefits

- Wear-free as no moving parts
- Compact or separate version
- Battery or network operation
- Variable installation position

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## Technical data

| Description             | Specification                                                                                                                        |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Enclosure               | IP67 according to EN 60529 and DIN 40050 (NEMA 4X/6)                                                                                 |
| Ambient temperature     | 0 °C ...60 °C (32 °F.... 140 °F) <sup>2)</sup>                                                                                       |
| Storage temperature     | –35 °C...85 °C (–40 °F...185 °F)                                                                                                     |
| Installation            | Cable max. 5, 10, 20, 30 m (16.4, 33, 65, 90 ft) from sensor                                                                         |
| Mechanical vibration    | 2 g, 1...800 Hz sinusoidal in all directions to IEC 68-2-6                                                                           |
| Design                  | Fibre glass reinforced polyamide in light-gray color                                                                                 |
| Power supply            | • Battery: replaceable 3.6 V LiSOCl (Lithium Thionyl Chloride) battery pack 32 Ah                                                    |
|                         | • Mains: 87 ... 265 V AC (50 ... 60 Hz)                                                                                              |
| Battery change interval | 6 years at 60 °C (140 °F) operation                                                                                                  |
| Display                 | LCD, 8 digits, additional 2 digits and symbols for status information                                                                |
| Push button             | One push button for toggling between display information                                                                             |
| Measuring function      | 0.5 Hz battery mode or 20 Hz mains-powered                                                                                           |
| Communication           | IrDA on display panel (MODBUS RTU protocol);<br>separate add-on serial interface moduls RS232 or RS485<br>(also MODBUS RTU protocol) |
| Digital output          | Two passive, galvanically isolated open drain-mos outputs A and B                                                                    |
|                         | Max. ±35 V, 50 mA                                                                                                                    |
| Pulse output A          | Preset to pulse output for forward flow                                                                                              |
| Pulse output B          | Preset to alarm for present failure                                                                                                  |
| Pulse width             | 5, 10, 20, 50, 100, 200, 500 ms                                                                                                      |
| Max. pulse frequency    | 100 Hz                                                                                                                               |
| Volume units            | FUE380: m <sup>3</sup>                                                                                                               |
|                         | FUS380: Preset at ordering (default: m <sup>3</sup> )                                                                                |
| Flow units              | FUE380: m <sup>3</sup> /h (default)                                                                                                  |
|                         | FUS380: Preset at ordering (default: m <sup>3</sup> /h)                                                                              |
| Alarm codes             | Track 1, 2 measuring, internal failure, battery low, flow overload,<br>pulse output frequency overload                               |
| Cable length            | Max. 30 meter between transmitter and pipe (factory sets: 5, 10, 20, 30 m)                                                           |
| EMC                     | Emission EN 61000-6-4                                                                                                                |
|                         | Immunity EN 61000-6-2                                                                                                                |
| Weight                  | Transmitter: 1.5 kg (3 lb)                                                                                                           |

## Flow values

The flow values  $Q_i$ ,  $Q_p$  and  $Q_s$  are listed on the AMFLO<sup>®</sup> Sonic UFA 280 system label.

In accordance with type approval requirements,  $Q_i$  ( $Q_{min}$ ) is the minimum flow rate and  $Q_p$  ( $Q_{nom}$ ) is the nominal flow rate.  $Q_s$  represents the maximum flow rate. The maximum flow rate limit ( $Q_{max}$ ) is set as 105% of  $Q_s$  and the low flow cutoff (lowest flow rate) is set as 50% of  $Q_i$ .

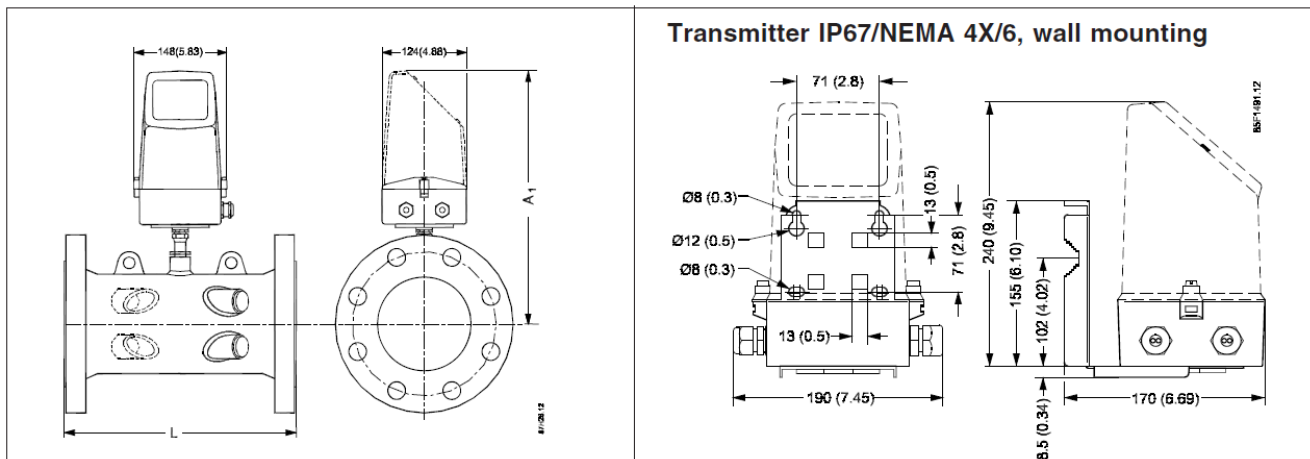
The dynamic measuring range of the AMFLO<sup>®</sup> Sonic UFA 280 is better than 1:100 or 1:50 in accordance with EN1434, OIML R 75 class 2 and MID.

In order to obtain optimum pulse frequency resolution in the range  $Q_{min}$  to  $Q_s$  with approx. 100 Hz at  $Q_s$ , three flow values may be selected for each nominal bore upon ordering. The order data is therefore also listed as values for  $Q_p$  ( $Q_n$ ). This flow rate lies between  $Q_i$  ( $Q_{min}$ ) and  $Q_s$  and represents the normal or typical flow rate in accordance with the type approval.

| DN   | $Q_s$<br>(m <sup>3</sup> /h) | $Q_{max}$<br>(m <sup>3</sup> /h)<br>(105% von $Q_s$ ) | $Q_p$<br>(m <sup>3</sup> /h) | $Q_i$<br>(m <sup>3</sup> /h)<br>(1:50 von $Q_p$ ) | $Q_i$<br>(m <sup>3</sup> /h)<br>(1:100 von $Q_p$ ) | Cut-off<br>(m <sup>3</sup> /h)<br>(50% von $Q_i$ ) | Cut-off<br>(% von $Q_{max}$ ) | Typical pulse<br>value<br>(l/pulse) |
|------|------------------------------|-------------------------------------------------------|------------------------------|---------------------------------------------------|----------------------------------------------------|----------------------------------------------------|-------------------------------|-------------------------------------|
| 50   | 30                           | 31,5                                                  | 15 <sup>3</sup>              | 0,3                                               | 0,15                                               | 0,075                                              | 0,24                          | 0,5                                 |
| 50   | 45                           | 47,25                                                 | 15 <sup>3</sup>              | 0,3                                               | 0,15                                               | 0,075                                              | 0,16                          | 0,5                                 |
| 50   | 45                           | 47,25                                                 | 30 <sup>4</sup>              | -                                                 | 0,30                                               | 0,150                                              | 0,32                          | 0,5                                 |
| 65   | 50                           | 52,5                                                  | 25 <sup>3</sup>              | 0,5                                               | 0,25                                               | 0,125                                              | 0,24                          | 0,5                                 |
| 65   | 72                           | 75,6                                                  | 253 <sup>3</sup>             | 0,5                                               | 0,25                                               | 0,125                                              | 0,17                          | 0,5                                 |
| 65   | 72                           | 75,6                                                  | 50 <sup>4</sup>              | -                                                 | 0,50                                               | 0,250                                              | 0,33                          | 0,5                                 |
| 80   | 80                           | 84                                                    | 40 <sup>3</sup>              | 0,8                                               | 0,40                                               | 0,200                                              | 0,24                          | 1                                   |
| 80   | 120                          | 126                                                   | 40 <sup>3</sup>              | 0,8                                               | 0,40                                               | 0,200                                              | 0,16                          | 1                                   |
| 80   | 120                          | 126                                                   | 80 <sup>4</sup>              | -                                                 | 0,80                                               | 0,400                                              | 0,32                          | 1                                   |
| 100  | 120                          | 126                                                   | 60 <sup>3</sup>              | 1,2                                               | 0,60                                               | 0,300                                              | 0,24                          | 1                                   |
| 100  | 180                          | 189                                                   | 60 <sup>3</sup>              | 1,2                                               | 0,60                                               | 0,300                                              | 0,16                          | 1                                   |
| 100  | 180                          | 189                                                   | 120 <sup>4</sup>             | 1-                                                | 1,20                                               | 0,600                                              | 0,32                          | 1                                   |
| 125  | 200                          | 210                                                   | 100 <sup>3</sup>             | 2,0                                               | 1,00                                               | 0,500                                              | 0,24                          | 1                                   |
| 125  | 280                          | 294                                                   | 100 <sup>3</sup>             | 2,0                                               | 1,00                                               | 0,500                                              | 0,17                          | 1                                   |
| 125  | 280                          | 294                                                   | 200 <sup>4</sup>             | -                                                 | 2,00                                               | 1,000                                              | 0,34                          | 1                                   |
| 150  | 300                          | 315                                                   | 150 <sup>3</sup>             | 3,0                                               | 1,50                                               | 0,750                                              | 0,24                          | 2,5                                 |
| 150  | 420                          | 441                                                   | 150 <sup>3</sup>             | 3,0                                               | 1,50                                               | 0,750                                              | 0,17                          | 2,5                                 |
| 150  | 420                          | 441                                                   | 300 <sup>4</sup>             | -                                                 | 3,00                                               | 1,500                                              | 0,34                          | 2,5                                 |
| 200  | 500                          | 525                                                   | 250 <sup>3</sup>             | 5,0                                               | 2,50                                               | 1,250                                              | 0,24                          | 2,5                                 |
| 200  | 700                          | 735                                                   | 250 <sup>3</sup>             | 5,0                                               | 2,50                                               | 1,250                                              | 0,17                          | 2,5                                 |
| 200  | 700                          | 735                                                   | 500 <sup>4</sup>             | -                                                 | 5,00                                               | 2,500                                              | 0,34                          | 2,5                                 |
| 250  | 800                          | 840                                                   | 400 <sup>3</sup>             | 8,0                                               | 4,00                                               | 2,000                                              | 0,24                          | 5                                   |
| 250  | 1120                         | 1176                                                  | 400 <sup>3</sup>             | 8,0                                               | 4,00                                               | 2,000                                              | 0,17                          | 5                                   |
| 250  | 1120                         | 1176                                                  | 800 <sup>4</sup>             | -                                                 | 8,00                                               | 4,000                                              | 0,34                          | 5                                   |
| 300  | 1120                         | 1176                                                  | 560 <sup>3</sup>             | 11,2                                              | 5,60                                               | 2,800                                              | 0,24                          | 5                                   |
| 300  | 1560                         | 1638                                                  | 560 <sup>3</sup>             | 11,2                                              | 5,60                                               | 2,800                                              | 0,17                          | 5                                   |
| 300  | 1560                         | 1638                                                  | 1120 <sup>4</sup>            | -                                                 | 11,20                                              | 5,600                                              | 0,34                          | 5                                   |
| 350  | 1500                         | 1575                                                  | 750 <sup>3</sup>             | 15,0                                              | 7,50                                               | 3,750                                              | 0,24                          | 50                                  |
| 350  | 2100                         | 2205                                                  | 750 <sup>3</sup>             | 15,0                                              | 7,50                                               | 3,750                                              | 0,17                          | 50                                  |
| 350  | 2100                         | 2205                                                  | 1500 <sup>4</sup>            | -                                                 | 15,00                                              | 7,500                                              | 0,34                          | 50                                  |
| 400  | 1900                         | 1995                                                  | 950 <sup>3</sup>             | 19,0                                              | 9,50                                               | 4,750                                              | 0,24                          | 50                                  |
| 400  | 2660                         | 2793                                                  | 950 <sup>3</sup>             | 19,0                                              | 9,50                                               | 4,750                                              | 0,17                          | 50                                  |
| 400  | 2660                         | 2793                                                  | 1900 <sup>4</sup>            | -                                                 | 19,00                                              | 9,500                                              | 0,34                          | 50                                  |
| 500  | 2950                         | 3097,5                                                | 1475 <sup>3</sup>            | 29,5                                              | 14,75                                              | 7,375                                              | 0,24                          | 100                                 |
| 500  | 4130                         | 4336,5                                                | 1475 <sup>3</sup>            | 29,5                                              | 14,75                                              | 7,375                                              | 0,17                          | 100                                 |
| 500  | 4130                         | 4336,5                                                | 2950 <sup>4</sup>            | -                                                 | 29,50                                              | 14,750                                             | 0,34                          | 100                                 |
| 600  | 4300                         | 4515                                                  | 2150 <sup>3</sup>            | 43,0                                              | 21,50                                              | 10,750                                             | 0,24                          | 100                                 |
| 600  | 6020                         | 6321                                                  | 2150 <sup>3</sup>            | 43,0                                              | 21,50                                              | 10,750                                             | 0,17                          | 100                                 |
| 600  | 6020                         | 6321                                                  | 4300 <sup>4</sup>            | -                                                 | 43,00                                              | 21,500                                             | 0,34                          | 100                                 |
| 700  | 5800                         | 6090                                                  | 2900 <sup>3</sup>            | 58,0                                              | 29,00                                              | 14,500                                             | 0,24                          | 100                                 |
| 700  | 8120                         | 8526                                                  | 2900 <sup>3</sup>            | 58,0                                              | 29,00                                              | 14,500                                             | 0,17                          | 100                                 |
| 700  | 8120                         | 8526                                                  | 5800 <sup>4</sup>            | -                                                 | 58,00                                              | 29,000                                             | 0,34                          | 100                                 |
| 800  | 7600                         | 7980                                                  | 3800 <sup>3</sup>            | 76,0                                              | 38,00                                              | 19,000                                             | 0,24                          | 100                                 |
| 800  | 10640                        | 11172                                                 | 3800 <sup>3</sup>            | 76,0                                              | 38,00                                              | 19,000                                             | 0,17                          | 100                                 |
| 800  | 10640                        | 11172                                                 | 7600 <sup>4</sup>            | -                                                 | 76,00                                              | 38,000                                             | 0,34                          | 100                                 |
| 900  | 10000                        | 10500                                                 | 5000 <sup>3</sup>            | 100,0                                             | 50,00                                              | 25,000                                             | 0,24                          | 100                                 |
| 900  | 14000                        | 14700                                                 | 5000 <sup>3</sup>            | 100,0                                             | 50,00                                              | 25,000                                             | 0,17                          | 100                                 |
| 900  | 14000                        | 14700                                                 | 10000 <sup>4</sup>           | -                                                 | 100,00                                             | 50,000                                             | 0,34                          | 100                                 |
| 1000 | 12000                        | 12600                                                 | 6000 <sup>3</sup>            | 120,0                                             | 60,00                                              | 30,000                                             | 0,24                          | 100                                 |
| 1000 | 16800                        | 17640                                                 | 6000 <sup>3</sup>            | 120,0                                             | 60,00                                              | 30,000                                             | 0,17                          | 100                                 |
| 1000 | 16800                        | 17640                                                 | 12000 <sup>4</sup>           | -                                                 | 120,00                                             | 60,000                                             | 0,34                          | 100                                 |
| 1200 | 18000                        | 18900                                                 | 9000 <sup>3</sup>            | 180,0                                             | 90,00                                              | 45,000                                             | 0,24                          | 100                                 |
| 1200 | 25200                        | 26460                                                 | 9000 <sup>3</sup>            | 180,0                                             | 90,00                                              | 45,000                                             | 0,17                          | 100                                 |
| 1200 | 25200                        | 26460                                                 | 18000 <sup>4</sup>           | -                                                 | 180,00                                             | 90,000                                             | 0,34                          | 100                                 |

<sup>3</sup>on demand <sup>4</sup>Standard with MID-homologation

## Dimensional drawings



## Sensor mass

| Size | PN 16     |        | PN 25     |        | PN 40    |        | PN 65    |      |             |
|------|-----------|--------|-----------|--------|----------|--------|----------|------|-------------|
|      | L         | Weight | L         | Weight | L        | Weight | Material | A1   | Lift<br>hug |
| DN   | mm        | kg     | mm        | kg     | mm       | kg     |          | mm   |             |
| 50   | -         |        |           | -      | 300 +0-2 | 10     | Bronze   | 350  | No          |
| 65   | -         |        |           | -      | 300 +0-2 | 15     | Bronze   | 360  | No          |
| 80   | -         |        |           | -      | 350 +0-2 | 18     | Bronze   | 370  | No          |
| 100  | 350+0-2   | 15     | -         | -      | 350+0-3  | 18     | Steel    | 375  | No          |
| 125  | 350+0-2   | 18     | -         | -      | 350+0-3  | 24     | Steel    | 380  | No          |
| 150  | 500+0-3   | 28     | -         | -      | 500+0-3  | 34     | Steel    | 390  | Yes         |
| 200  | 500+0-3   | 38     | 500+0-3   | 47     | 500+0-3  | 55     | Steel    | 414  | Yes         |
| 250  | 600+0-3   | 60     | 600+0-3   | 76     | 600+0-3  | 91     | Steel    | 440  | Yes         |
| 300  | 500+0-3   | 66     | 500+0-3   | 81     | -        | -      | Steel    | 466  | Yes         |
| 350  | 550+0-3   | 94     | 550+0-3   | 121    | -        | -      | Steel    | 495  | Yes         |
| 400  | 600+0-3   | 124    | 600+0-3   | 153    | -        | -      | Steel    | 507  | Yes         |
| 500  | 625+0-3   | 190    | 625+0-3   | 244    | -        | -      | Steel    | 558  | Yes         |
| 600  | 750+0-3   | 303    | 750+0-3   | 365    | -        | -      | Steel    | 609  | Yes         |
| 700  | 875+0-3   | 361    | 875+0-3   | 552    | -        | -      | Steel    | 660  | Yes         |
| 800  | 1000+0-3  | 494    | 1000+0-3  | 770    | -        | -      | Steel    | 710  | Yes         |
| 900  | 1230 +/-6 | 475    | 1300 +/-6 | 835    | -        | -      | Steel    | 810  | Yes         |
| 1000 | 1300 +/-6 | 594    | 1370 +/-6 | 1078   | -        | -      | Steel    | 910  | Yes         |
| 1200 | 1360 +/-6 | 732    | -         | -      | -        | -      | Steel    | 1110 | Yes         |

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