

# BERMAD Meters

Merging monitoring & control



## Battery Operated Electromagnetic flowmeter

MUT2200  
MC406



Bluetooth™



The MUT2200 with MC406 is a battery powered electromagnetic water meter for use in district metering areas (DMA), water abstraction, and custody transfer measurement of potable water (MI-001, OIML R49), irrigation, and many other applications. Unlike other water meters, the MUT2200 is a maintenance-free meter, offering a much wider range of flow, in a compact or remote mounted version. Thanks to the optimized flow profile, the MUT2200 can be installed virtually anywhere with minimal straight inlet or outlet runs. With optional pressure and temperature sensors, GSM/GPRS integrated modem and 12...24Vdc power source, the meter is the perfect solution for pressure management systems. The highly robust structure, allows burial installation or the use in flooded areas. A full on-site verification without process interruption can be carried out using the Field Vericator service tool

## Applications

- District metering of potable water
- Distribution, municipal water
- Industrial waste water
- Industrial process liquids, muds and concretes
- Fiscal measures, custody transfer
- Irrigation
- Booster pump stations
- Lift stations

## Key advantages

- No moving parts
- Neglectable pressure drop
- Long lasting stability and precision
- Zero maintenance
- Extremely sturdy structure
- High chemical resilience
- Wider range of measurement

## Product's benefit

**High performances to a low cost of ownership:** Capability to read flow velocities of 0.015 m/s (MID-001 OIML R49 certified), within Class 1 accuracy

**Multiple outputs:** pulse, analog 4-20mA, Modbus, frequency, Hart protocol and programmable output

**No data lost:** Data automatically stored in the internal EEPROM memory. Up to 100.000 lines of active datalogging

**Information always available:** Add-on communication module GSM/GPRS automatically sends the information via SMS, e-mail or on a website portal [www.euromagdata.com](http://www.euromagdata.com) with personal ID and password. Accessible also from smart phones and tablets. Configurable FTP communication.

**Empty pipe detection:** Empty pipe electrode supplied as standard ( $\geq$  DN65). Empty pipe detection on measuring electrodes standard for all sizes

**Flow - pressure – temperature: all at the same time:** Add on modules of temperature and pressure readying make the MUT2200 with MC406 one of the most complete

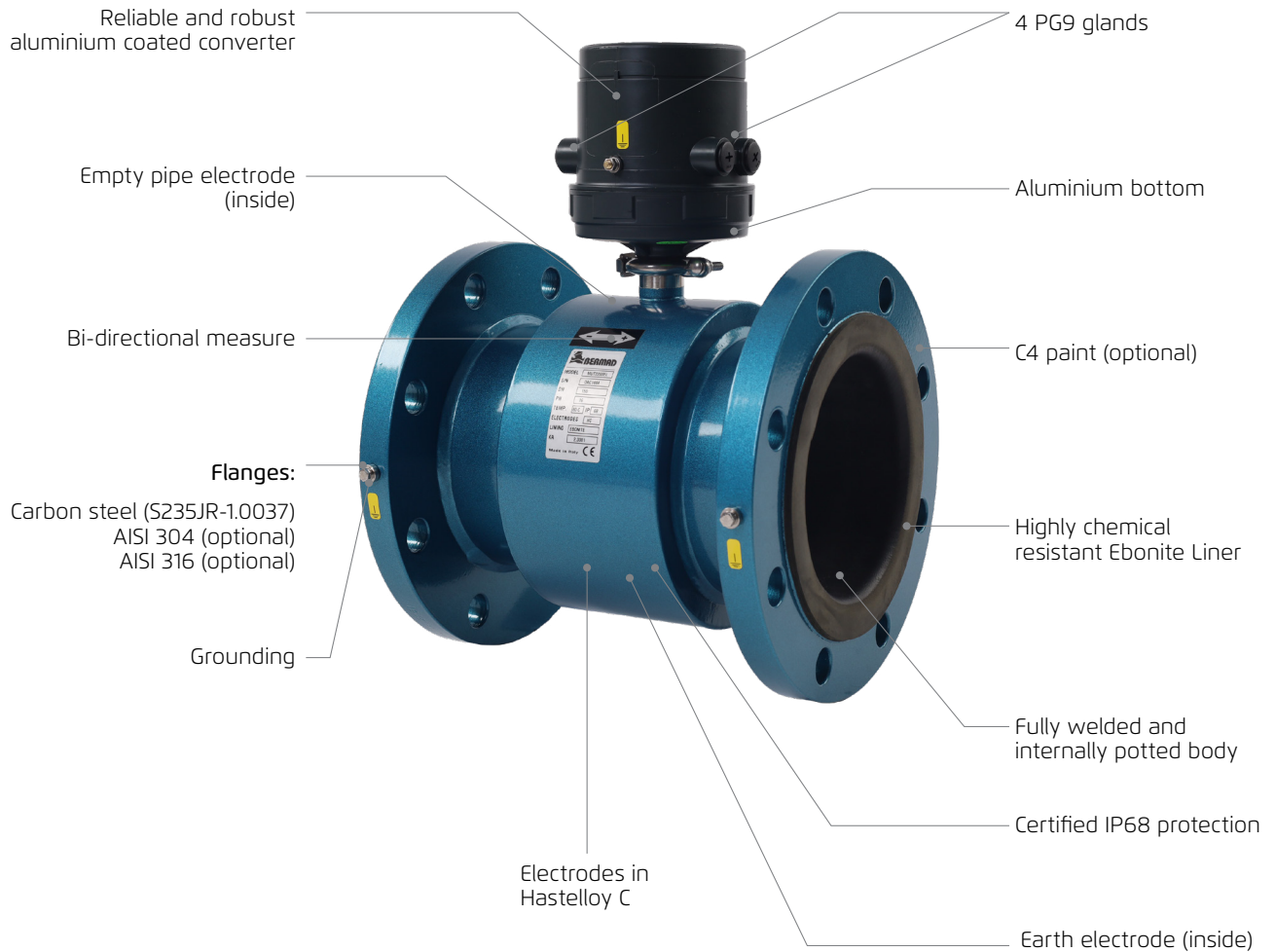
electromagnetic flowmeter available in the market

**Easy management, easy programming:** A software is supplied with the unit to allow users to communicate with the MC406 via IRCOM port to any pc, lap top or windows tablet.

**Certifications and compliance:** OIML R49-MID Class 1 (on request) / EX - IEC IECEx (on request and only separate version) / NSF ANSI61 (On model MUT2300US)

**Always verified:** The Euromag FIELD VERIFICATOR is available for full on-site verification, without interruption of the process

## Features



— The electromagnetic flowmeter designed for the toughest applications —



DS401-1-ENG



## Features

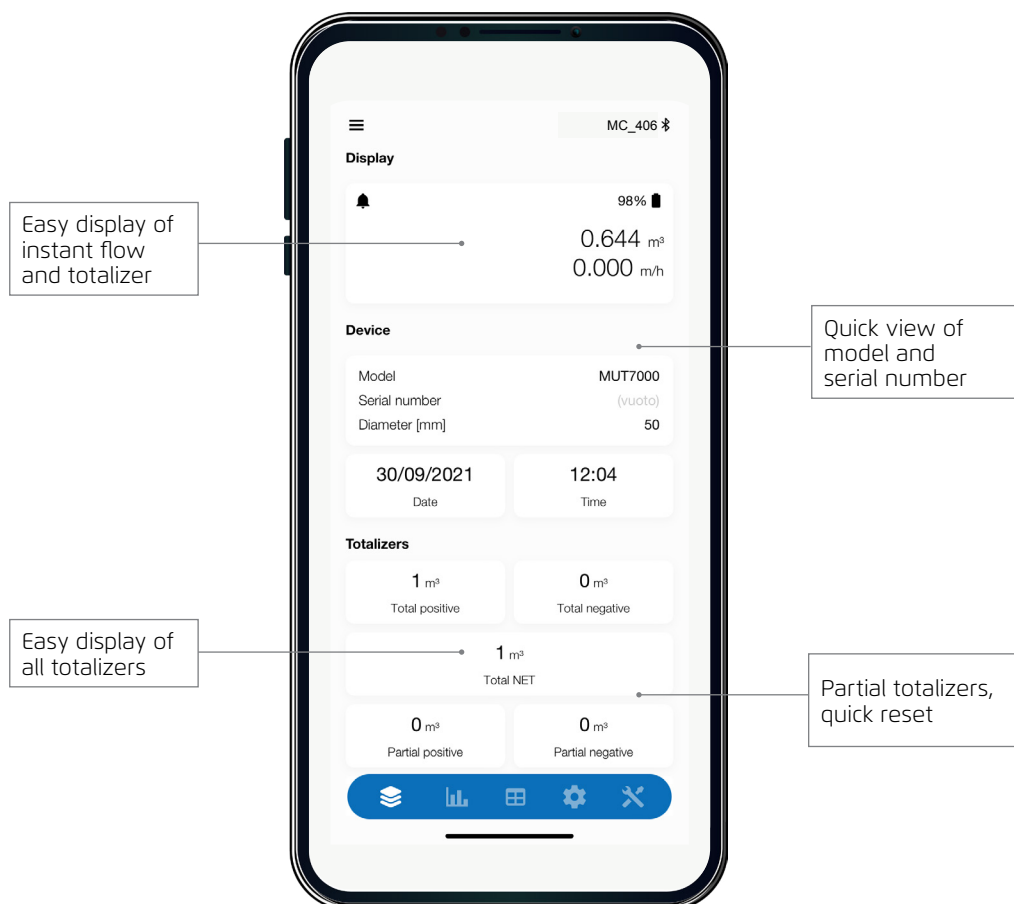




## Easy and intuitive interface

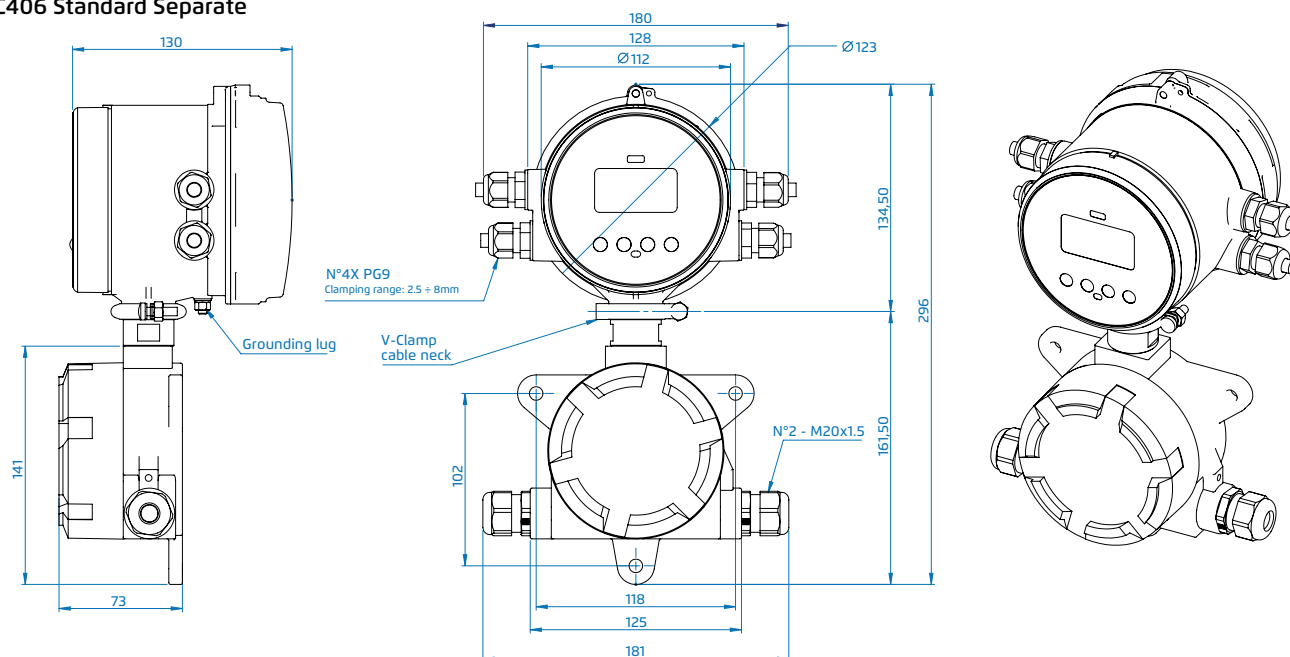
Everything you need from your flowmeter with a blink of an APP.

In a fast developing and interconnected world, data must be available and exchanged quick and easy. Mag-Net app is the Euromag solution.

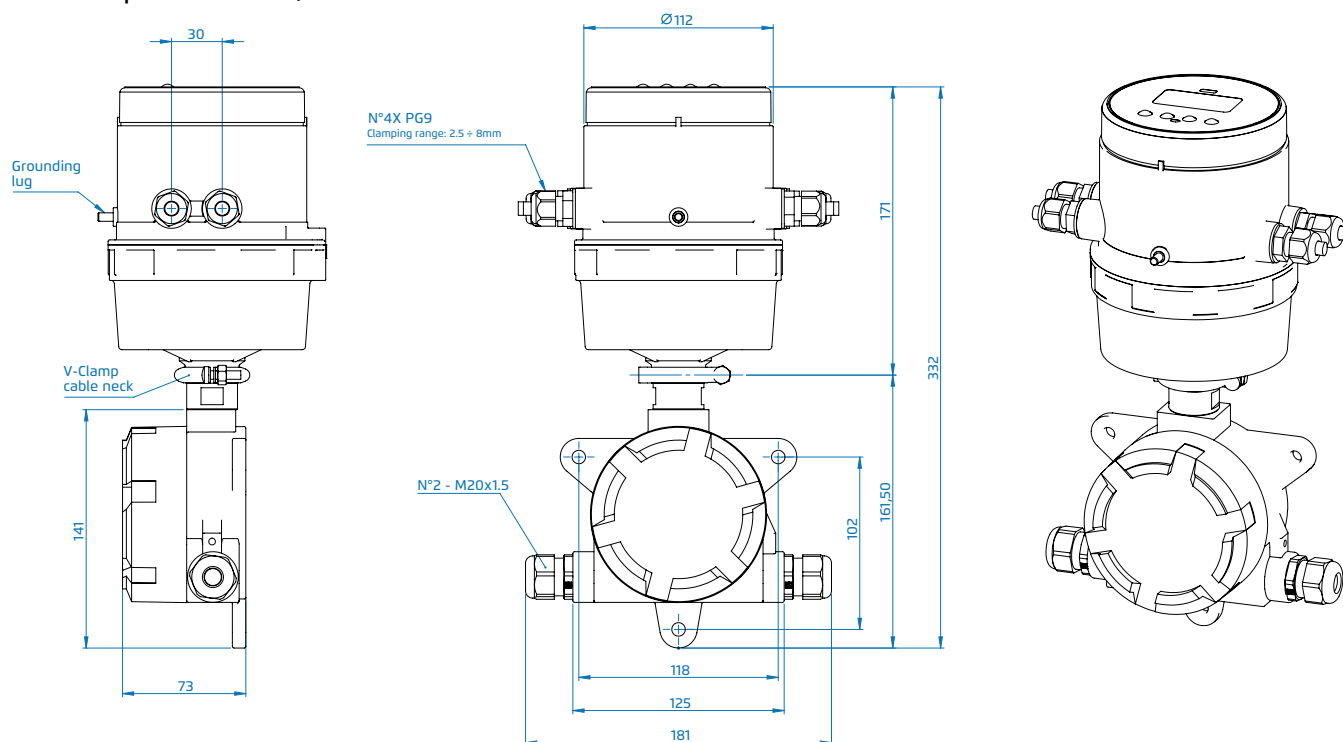


## Overview Separate Converter

### MC406 Standard Separate



### MC406 Separate with GSM/GPRS



|                        |                                                                                                                                                                                                                                                                                             |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transmitter type       | Battery powered - 2 x D Cell 3.6 V * / 12-24VDC                                                                                                                                                                                                                                             |
| Battery life           | Lithium battery pack up to 10 years                                                                                                                                                                                                                                                         |
| Accuracy               | 0.2 % +/- 2 mm/s - insertion sensors 2% of rate +/- 2mm/s                                                                                                                                                                                                                                   |
| Temperature            | Ambient: -20 ... +60 C° (-4 ... +140 F)<br>Media -25 ... 80 C° (-13 ... +176 F)<br>Storage -40 ... +70 C° (-22 ... +158 F)                                                                                                                                                                  |
| Enclosure              | Technopolymer case with aluminum bottom on compact vertical version.<br>IP 68. Remote wall mount bracket in carbon steel zinc plated                                                                                                                                                        |
| Cable entries          | 4X PG9 Glands I/O - 2X M20 x 1.5. Glands junction box in remote version                                                                                                                                                                                                                     |
| Custody transfer       | Type approved OIML R49-1 2013 / EN 14154 MID EN-ISO 4064 -<br>Certificate n. T10713                                                                                                                                                                                                         |
| Conformity             | EMC: EN 61010 - LVD: EN 61326 ; EN/IEC 60529 IP68                                                                                                                                                                                                                                           |
| Sensor type            | Full bore up to DN 1000                                                                                                                                                                                                                                                                     |
| Flow velocity range    | 0.015 m/s up to 10 m/s                                                                                                                                                                                                                                                                      |
| Sampling rate          | Standard mode 1 / 5 Hz up to 1 / 60 Hz (default 1 / 15 Hz) max 3.125 Hz                                                                                                                                                                                                                     |
| Installation           | Integral (compact) or remote with factory mounted sensor cable in 5 m (16.4 ft) up to 30 m (98.4 ft)                                                                                                                                                                                        |
| Digital filters        | Damping - cut-off (0.05 m/s default) - bypass - peak cut                                                                                                                                                                                                                                    |
| Display and keys       | LCD display - Index, menu, and symbols icons for dedicated information<br>4 Push buttons to access all functions<br>Totalizer informations can be displayed with 5 decimal digits                                                                                                           |
| Displayed informations | Live flowrate<br>Total positive totalizer (T+)<br>Total negative totalizer (T-)<br>Partial positive totalizer (P+)<br>Partial negative totalizer (P-)<br>Time & date<br>Converter temperature<br>Process pressure and temperature (if available)<br>Parameters corresponding code and value |

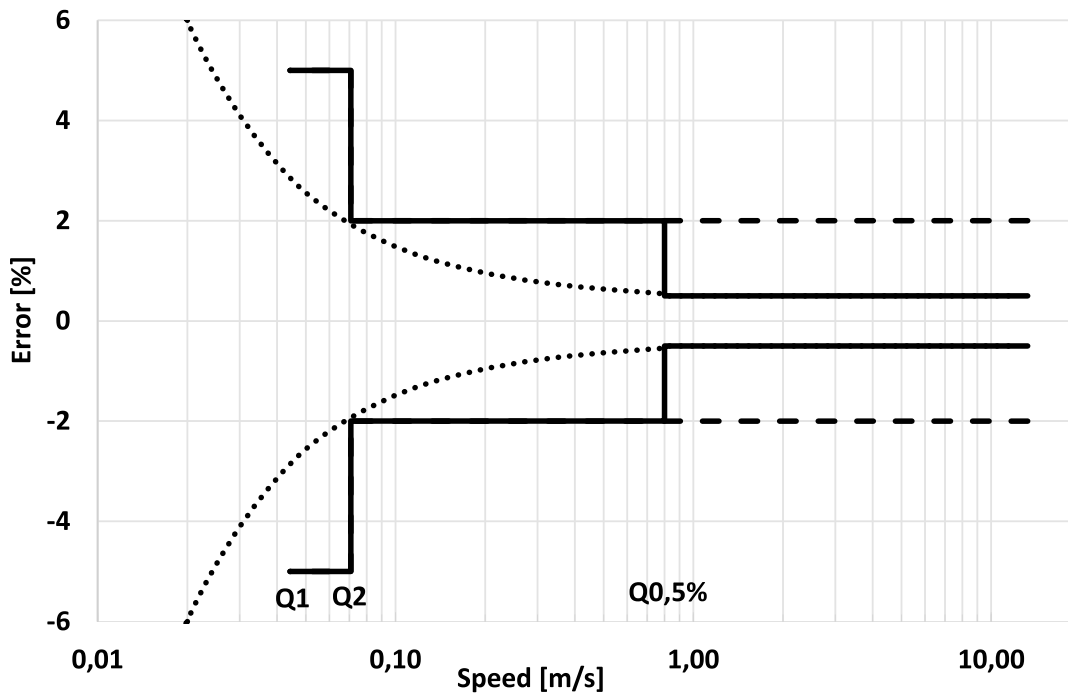
|                                            |                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flow Units                                 | m, m3, l, ML, ft3, GAL                                                                                                                                                                                                                                                                                       |
| Outputs                                    | 2 pulses passive outputs (MOS), individual galvanically isolated - clean contact<br>Maximum load +/- 35V DC, 100 mA short circuit protected                                                                                                                                                                  |
| Communication                              | Integrated BERMAD IrComm interface                                                                                                                                                                                                                                                                           |
| Datalogging                                | 100,000 lines of data with a frequency of log between 1 minute and 120 minutes (default 15 minutes)                                                                                                                                                                                                          |
| Add on modules                             | GSM/GPRS BERMAD Module<br>Pressure (1) and temperature (2)<br>Energy metering ready                                                                                                                                                                                                                          |
| Totalizers                                 | 4 (2 positive and 2 negative)                                                                                                                                                                                                                                                                                |
| Date and time                              | Yes                                                                                                                                                                                                                                                                                                          |
| Data protection                            | Password available, automatic firmware check and recover during the update                                                                                                                                                                                                                                   |
| Alarms and status                          | Status icon displayed and alarm logged in the datalogger                                                                                                                                                                                                                                                     |
| Self diagnostic                            | Alarms available: <ul style="list-style-type: none"> <li>• excitation failure</li> <li>• empty pipe on the 4th electrode</li> <li>• empty pipe on the measuring electrodes</li> <li>• high temperature</li> <li>• high voltage supply</li> <li>• pulse overlapped</li> <li>• wet electronic board</li> </ul> |
| External verification                      | Field verifactor available for calibration verification and electronic status                                                                                                                                                                                                                                |
| Software for communication and programming | Commissioning (equal settings of meters) - Data print for documentation - Data export (CSV file) - Firmware update - Read instant flowrate - Read and write all non volatile parameters - Download internal datalogger - View instrument event logger                                                        |

\* Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Good", UN 3090 and UN 3091. Special transport documentation is required to observe these regulations. This may influence both transport time and cost



## Measuring accuracy

Each flowmeter is standard wet calibrated under reference conditions by direct volume comparison. The performance of the flowmeter is defined and documented in an individual calibration certificate. Accuracy 0,2% +/- 2mm/s (0,2% +/- 1mm/s on request)



## Flow rate

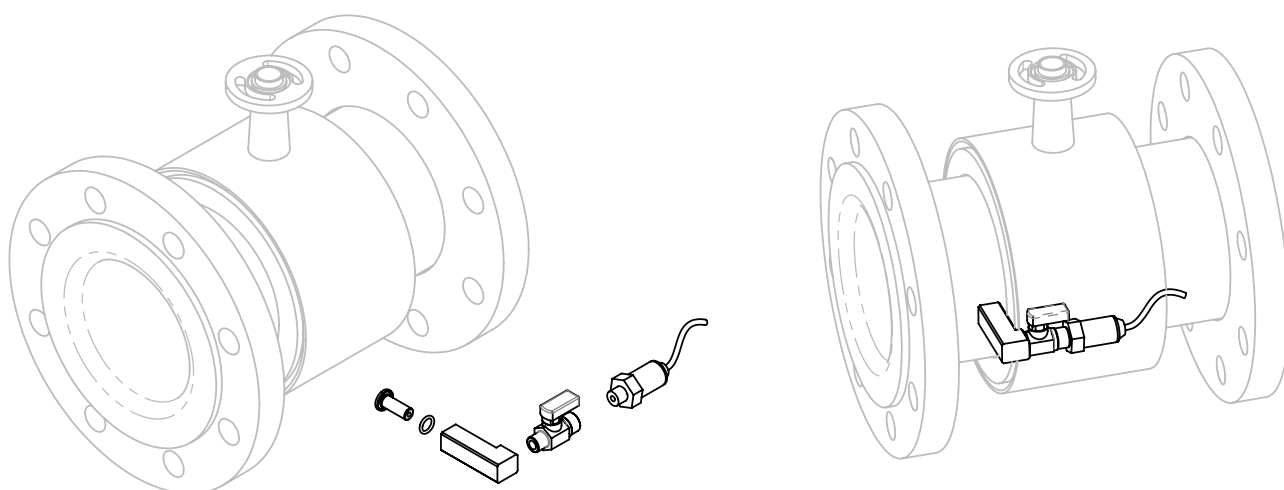
| Sensor diameter | Flow rate [m³/h] |           |        |          |           | Ratio Q3/ Q1 |
|-----------------|------------------|-----------|--------|----------|-----------|--------------|
|                 | DN               |           |        |          |           |              |
|                 | Min. Q1          | Trans. Q2 | Q0.5%  | Perm. Q3 | Overl. Q4 |              |
| DN25 - 1"       | 0.080            | 0.128     | 1.40   | 10.00    | 12.50     | 125          |
| DN32 - 1¼"      | 0.080            | 0.128     | 2.30   | 10.00    | 12.50     | 125          |
| DN40 - 1½"      | 0.128            | 0.205     | 3.60   | 16.00    | 20.00     | 125          |
| DN 50 - 2"      | 0.200            | 0.320     | 5.65   | 25.00    | 31.25     | 125          |
| DN 65 - 2½"     | 0.320            | 0.512     | 9.55   | 40.00    | 50.00     | 125          |
| DN 80 - 3"      | 0.504            | 0.806     | 14.50  | 63.00    | 78.75     | 125          |
| DN 100 - 4"     | 0.800            | 1.280     | 22.60  | 100.00   | 125.00    | 125          |
| DN 125 - 5"     | 1.280            | 2.048     | 35.30  | 160.00   | 200.00    | 125          |
| DN 150 - 6"     | 2.000            | 3.200     | 51.00  | 250.00   | 312.50    | 125          |
| DN 200 - 8"     | 3.200            | 5.120     | 90.50  | 400.00   | 500.00    | 125          |
| DN 250 - 10"    | 5.040            | 8.064     | 140.00 | 630.00   | 787.50    | 125          |
| DN 300 - 12"    | 8.000            | 12.800    | 200.00 | 1.000.00 | 1.250.00  | 125          |
| DN 350 - 14"    | 12.800           | 20.480    | 280.00 | 1.600.00 | 2.000.00  | 125          |
| DN 400 - 16"    | 12.800           | 20.480    | 360.00 | 1.600.00 | 2.000.00  | 125          |

| Sensor diameter | Flow rate [m³/h] |           |       |          |           | Ratio Q3/ Q1 |
|-----------------|------------------|-----------|-------|----------|-----------|--------------|
|                 | DN               |           |       |          |           |              |
|                 | Min. Q1          | Trans. Q2 | Q0.5% | Perm. Q3 | Overl. Q4 |              |
| DN450 - 18"     | 25               | 40        | 460   | 2.500    | 3.125     | 100          |
| DN500 - 20"     | 25               | 40        | 570   | 2.500    | 3.125     | 100          |
| DN600 - 24"     | 50               | 80        | 820   | 4.000    | 5.000     | 80           |
| DN700 - 28"     | 50               | 80        | 1.100 | 4.000    | 5.000     | 80           |
| DN800 - 32"     | 100              | 160       | 1.450 | 6.300    | 7.875     | 63           |
| DN900 - 36"     | 100              | 160       | 1.840 | 6.300    | 7.875     | 63           |
| DN1000 - 40"    | 200              | 320       | 2.270 | 10.000   | 12.500    | 50           |
| DN1200 - 48"    | 320              | 512       | 3.270 | 16.000   | 20.000    | 50           |
| DN1400 - 56"    | 500              | 800       | 4.440 | 25.000   | 31.250    | 50           |
| DN1500 - 60"    | 800              | 1.280     | 5.100 | 40.000   | 50.000    | 50           |
| DN1600 - 64"    | 1.260            | 2.016     | 5.800 | 63.000   | 78.750    | 50           |
| DN1800 - 72"    | 2.000            | 3.200     | 7.350 | 100.000  | 125.000   | 50           |
| DN2000 - 80"    | 3.200            | 5.120     | 9.100 | 160.000  | 200.000   | 50           |

## MUT2200EL general features

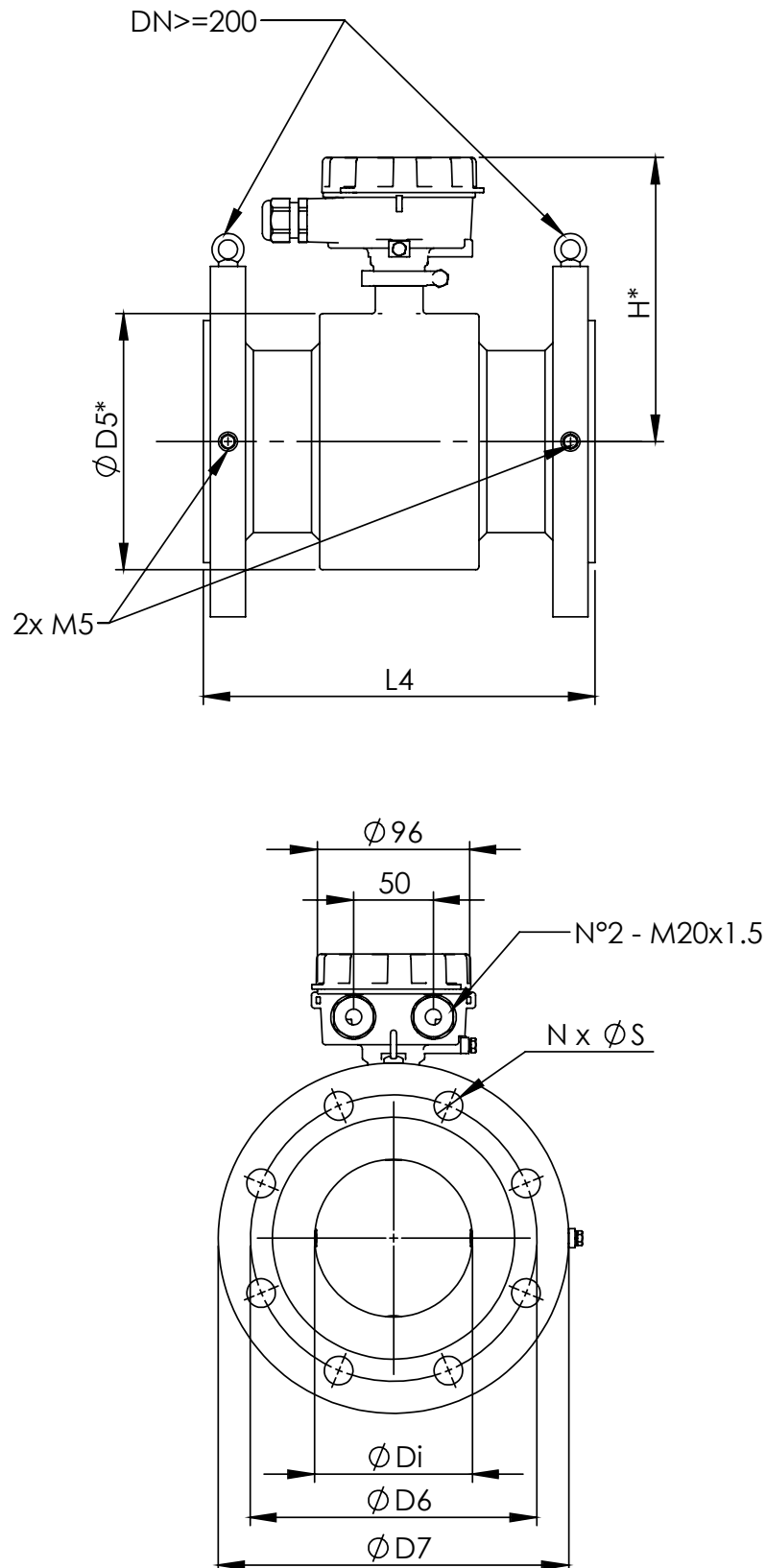
|                                        |        |                                                                                                                             |     |     |     |     |     |                                               |      |      |      |      |      |      |      |      |     |
|----------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----------------------------------------------|------|------|------|------|------|------|------|------|-----|
| Flow tube material                     |        | AISI 304 (std), AISI 316                                                                                                    |     |     |     |     |     |                                               |      |      |      |      |      |      |      |      |     |
| Flanges material                       |        | Carbon steel painted (std), AISI 304, AISI 316                                                                              |     |     |     |     |     |                                               |      |      |      |      |      |      |      |      |     |
| Electrodes material                    |        | Electrodes material Hastelloy C (std), Hastelloy B, Titanium, Tantalio, Platinum                                            |     |     |     |     |     |                                               |      |      |      |      |      |      |      |      |     |
| Internal lining and liquid temperature |        | Internal lining                                                                                                             |     |     |     |     |     | Liquid temperature                            |      |      |      |      |      |      |      |      |     |
|                                        |        | PTFE                                                                                                                        |     |     |     |     |     | Standard -40 /+130°C (up to +180° on request) |      |      |      |      |      |      |      |      |     |
|                                        |        | Ebonite                                                                                                                     |     |     |     |     |     | -40°C / +80°C                                 |      |      |      |      |      |      |      |      |     |
| Available Sizes                        | mm     | 15                                                                                                                          | 20  | 25  | 32  | 40  | 50  | 65                                            | 80   | 100  | 125  | 150  | 200  | 250  | 300  | 350  | 400 |
|                                        | Inches | ½"                                                                                                                          | ¾"  | 1"  | 1¼" | 1½" | 2"  | 2½"                                           | 3"   | 4"   | 5"   | 6"   | 8"   | 10"  | 12"  | 14"  | 16" |
|                                        | mm     | 450                                                                                                                         | 500 | 600 | 700 | 800 | 900 | 1000                                          | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 2000 |     |
|                                        | Inches | 18"                                                                                                                         | 20" | 24" | 28" | 32" | 36" | 40"                                           | 48"  | 52"  | 56"  | 60"  | 64"  | 68"  | 72"  | 80"  |     |
| Flange standards available             |        | EN1092-1, ANSI 150, ANSI 300, ANSI 600, ANSI 900, DIN 2501, BS 4504, AS 2129 (TABLE D - E - F), AS 4087, ISO 7005-1, KS 10K |     |     |     |     |     |                                               |      |      |      |      |      |      |      |      |     |
| Protection Degree                      |        | IP68 1.5 m continuous immersion (EN 60529)                                                                                  |     |     |     |     |     |                                               |      |      |      |      |      |      |      |      |     |
| Electrical connections                 |        | Cable glands M20 x 1.5 + terminal block + sealing resin                                                                     |     |     |     |     |     |                                               |      |      |      |      |      |      |      |      |     |

## Pressure port integrated



## Applications

MUT2200EL sensors are suitable for any on-line application. These sensors are typically used in the measure of potable or not potable water, industrial waste water, industrial process liquids, muds and concretes.



| MUT2200EL PN 10 EN 1092-1 |              |      |      |      |      |    |    |      |      |      |      |
|---------------------------|--------------|------|------|------|------|----|----|------|------|------|------|
| DN                        | L4           | D5   | Di   | D6   | D7   | N  | S  | H    | H1   | H2   | H3   |
| 15                        | 200(+0/-3)   | 84   | 11   | 65   | 95   | 4  | 14 | 156  | 195  | 190  | 236  |
| 20                        | 200(+0/-3)   | 84   | 17   | 75   | 105  | 4  | 14 | 156  | 195  | 190  | 236  |
| 25                        | 200(+0/-3)   | 74   | 24   | 85   | 115  | 4  | 14 | 151  | 190  | 185  | 231  |
| 32                        | 200(+0/-3)   | 83   | 31   | 100  | 140  | 4  | 18 | 155  | 195  | 190  | 236  |
| 40                        | 200(+0/-3)   | 88   | 37   | 110  | 150  | 4  | 18 | 158  | 197  | 192  | 238  |
| 50                        | 200(+0/-3)   | 102  | 47   | 125  | 165  | 4  | 18 | 165  | 204  | 199  | 245  |
| 65                        | 200(+0/-3)   | 114  | 63   | 145  | 185  | 8  | 18 | 171  | 210  | 205  | 251  |
| 80                        | 200(+0/-3)   | 127  | 75   | 160  | 200  | 8  | 18 | 177  | 217  | 212  | 258  |
| 100                       | 250(+0/-3)   | 161  | 99   | 180  | 220  | 8  | 18 | 194  | 234  | 229  | 275  |
| 125                       | 250(+0/-3)   | 187  | 124  | 210  | 250  | 8  | 18 | 207  | 247  | 242  | 288  |
| 150                       | 300(+0/-3)   | 210  | 152  | 240  | 285  | 8  | 22 | 219  | 258  | 253  | 299  |
| 200                       | 350(+0/-3)   | 261  | 201  | 295  | 340  | 8  | 22 | 244  | 284  | 279  | 325  |
| 250                       | 450(+0/-5)   | 319  | 255  | 350  | 395  | 12 | 22 | 273  | 313  | 308  | 354  |
| 300                       | 500(+0/-5)   | 371  | 308  | 400  | 445  | 12 | 22 | 299  | 339  | 334  | 380  |
| 350                       | 550(+0/-5)   | 404  | 340  | 460  | 505  | 16 | 22 | 316  | 355  | 350  | 396  |
| 400                       | 600(+0/-5)   | 455  | 390  | 515  | 565  | 16 | 26 | 341  | 381  | 376  | 422  |
| 450                       | 450(+0/-7)   | 519  | 441  | 565  | 615  | 20 | 26 | 373  | 413  | 408  | 454  |
| 500                       | 500(+0/-9)   | 570  | 492  | 620  | 670  | 20 | 26 | 399  | 438  | 433  | 479  |
| 600                       | 600(+0/-9)   | 684  | 592  | 725  | 780  | 20 | 30 | 456  | 495  | 490  | 536  |
| 700                       | 700(+0/-9)   | 783  | 695  | 840  | 895  | 24 | 30 | 505  | 545  | 540  | 586  |
| 800                       | 800(+0/-9)   | 885  | 795  | 950  | 1015 | 24 | 33 | 556  | 596  | 591  | 637  |
| 900                       | 900(+0/-15)  | 996  | 896  | 1050 | 1115 | 28 | 33 | 612  | 651  | 646  | 692  |
| 1000                      | 1000(+0/-15) | 1098 | 996  | 1160 | 1230 | 28 | 36 | 663  | 702  | 697  | 743  |
| 1200                      | 1200(+0/-15) | 1312 | 1199 | 1380 | 1445 | 32 | 39 | 770  | 809  | 804  | 850  |
| 1400                      | 1400(+0/-15) | 1512 | 1402 | 1590 | 1675 | 36 | 42 | 870  | 909  | 904  | 950  |
| 1500                      | 1500(+0/-15) | 1612 | 1500 | 1700 | 1785 | 36 | 44 | 920  | 959  | 954  | 1000 |
| 1600                      | 1600(+0/-15) | 1712 | 1602 | 1820 | 1915 | 40 | 48 | 970  | 1009 | 1004 | 1050 |
| 1800                      | 1800(+0/-15) | 1922 | 1803 | 2020 | 2115 | 44 | 48 | 1075 | 1114 | 1109 | 1155 |
| 2000                      | 2000(+0/-15) | 2122 | 2004 | 2230 | 2325 | 48 | 48 | 1175 | 1214 | 1209 | 1255 |

| MUT2200EL PN 16 EN 1092-1 |              |      |      |      |      |    |    |      |      |      |      |
|---------------------------|--------------|------|------|------|------|----|----|------|------|------|------|
| DN                        | L4           | D5   | Di   | D6   | D7   | N  | S  | H    | H1   | H2   | H3   |
| 15                        | 200(+0/-3)   | 84   | 11   | 65   | 95   | 4  | 14 | 156  | 195  | 190  | 236  |
| 20                        | 200(+0/-3)   | 84   | 17   | 75   | 105  | 4  | 14 | 156  | 195  | 190  | 236  |
| 25                        | 200(+0/-3)   | 74   | 24   | 85   | 115  | 4  | 14 | 151  | 190  | 185  | 231  |
| 32                        | 200(+0/-3)   | 83   | 31   | 100  | 140  | 4  | 18 | 155  | 195  | 190  | 236  |
| 40                        | 200(+0/-3)   | 88   | 37   | 110  | 150  | 4  | 18 | 158  | 197  | 192  | 238  |
| 50                        | 200(+0/-3)   | 102  | 47   | 125  | 165  | 4  | 18 | 165  | 204  | 199  | 245  |
| 65                        | 200(+0/-3)   | 114  | 63   | 145  | 185  | 8  | 18 | 171  | 210  | 205  | 251  |
| 80                        | 200(+0/-3)   | 127  | 75   | 160  | 200  | 8  | 18 | 177  | 217  | 212  | 258  |
| 100                       | 250(+0/-3)   | 161  | 99   | 180  | 220  | 8  | 18 | 194  | 234  | 229  | 275  |
| 125                       | 250(+0/-3)   | 187  | 124  | 210  | 250  | 8  | 18 | 207  | 247  | 242  | 288  |
| 150                       | 300(+0/-3)   | 210  | 152  | 240  | 285  | 8  | 22 | 219  | 258  | 253  | 299  |
| 200                       | 350(+0/-3)   | 261  | 201  | 295  | 340  | 12 | 22 | 244  | 284  | 279  | 325  |
| 250                       | 450(+0/-5)   | 319  | 255  | 355  | 405  | 12 | 26 | 273  | 313  | 308  | 354  |
| 300                       | 500(+0/-5)   | 371  | 308  | 410  | 460  | 12 | 26 | 299  | 339  | 334  | 380  |
| 350                       | 550(+0/-5)   | 404  | 340  | 470  | 520  | 16 | 26 | 316  | 355  | 350  | 396  |
| 400                       | 600(+0/-5)   | 455  | 390  | 525  | 580  | 16 | 30 | 341  | 381  | 376  | 422  |
| 450                       | 450(+0/-7)   | 519  | 439  | 585  | 640  | 20 | 30 | 373  | 413  | 408  | 454  |
| 500                       | 500(+0/-9)   | 570  | 490  | 650  | 715  | 20 | 33 | 399  | 438  | 433  | 479  |
| 600                       | 600(+0/-9)   | 684  | 592  | 770  | 840  | 20 | 36 | 456  | 495  | 490  | 536  |
| 700                       | 700(+0/-9)   | 783  | 691  | 840  | 910  | 24 | 36 | 505  | 545  | 540  | 586  |
| 800                       | 800(+0/-9)   | 885  | 791  | 950  | 1025 | 24 | 39 | 556  | 596  | 591  | 637  |
| 900                       | 900(+0/-15)  | 996  | 890  | 1050 | 1125 | 28 | 39 | 612  | 651  | 646  | 692  |
| 1000                      | 1000(+0/-15) | 1098 | 992  | 1170 | 1255 | 28 | 42 | 663  | 702  | 697  | 743  |
| 1200                      | 1200(+0/-15) | 1312 | 1191 | 1390 | 1485 | 32 | 48 | 770  | 809  | 804  | 850  |
| 1400                      | 1400(+0/-15) | 1512 | 1392 | 1590 | 1685 | 36 | 48 | 870  | 909  | 904  | 950  |
| 1500                      | 1500(+0/-15) | 1612 | 1492 | 1710 | 1820 | 36 | 57 | 920  | 959  | 954  | 1000 |
| 1600                      | 1600(+0/-15) | 1712 | 1594 | 1820 | 1930 | 40 | 56 | 970  | 1009 | 1004 | 1050 |
| 1800                      | 1800(+0/-15) | 1922 | 1795 | 2020 | 2130 | 44 | 56 | 1075 | 1114 | 1109 | 1155 |
| 2000                      | 2000(+0/-15) | 2122 | 1994 | 2230 | 2345 | 48 | 62 | 1175 | 1214 | 1209 | 1255 |

| MUT2200EL PN 25 EN 1092-1 |              |      |      |      |      |    |    |      |      |      |      |
|---------------------------|--------------|------|------|------|------|----|----|------|------|------|------|
| DN                        | L4           | D5   | Di   | D6   | D7   | N  | S  | H    | H1   | H2   | H3   |
| 15                        | 200(+0/-3)   | 84   | 11   | 65   | 95   | 4  | 14 | 156  | 195  | 190  | 236  |
| 20                        | 200(+0/-3)   | 84   | 17   | 75   | 105  | 4  | 14 | 156  | 195  | 190  | 236  |
| 25                        | 200(+0/-3)   | 74   | 24   | 85   | 115  | 4  | 14 | 151  | 190  | 185  | 231  |
| 32                        | 200(+0/-3)   | 83   | 31   | 100  | 140  | 4  | 18 | 155  | 195  | 190  | 236  |
| 40                        | 200(+0/-3)   | 88   | 37   | 110  | 150  | 4  | 18 | 158  | 197  | 192  | 238  |
| 50                        | 200(+0/-3)   | 102  | 47   | 125  | 165  | 4  | 18 | 165  | 204  | 199  | 245  |
| 65                        | 200(+0/-3)   | 114  | 63   | 145  | 185  | 8  | 18 | 171  | 210  | 205  | 251  |
| 80                        | 200(+0/-3)   | 127  | 75   | 160  | 200  | 8  | 18 | 177  | 217  | 212  | 258  |
| 100                       | 250(+0/-3)   | 161  | 99   | 190  | 235  | 8  | 22 | 194  | 234  | 229  | 275  |
| 125                       | 250(+0/-3)   | 187  | 124  | 220  | 270  | 8  | 26 | 207  | 247  | 242  | 288  |
| 150                       | 300(+0/-3)   | 210  | 152  | 250  | 300  | 8  | 26 | 219  | 258  | 253  | 299  |
| 200                       | 350(+0/-3)   | 261  | 201  | 310  | 360  | 12 | 26 | 244  | 284  | 279  | 325  |
| 250                       | 450(+0/-5)   | 319  | 255  | 370  | 425  | 12 | 30 | 273  | 313  | 308  | 354  |
| 300                       | 500(+0/-5)   | 371  | 306  | 430  | 485  | 16 | 30 | 299  | 339  | 334  | 380  |
| 350                       | 550(+0/-5)   | 404  | 338  | 490  | 555  | 16 | 33 | 316  | 355  | 350  | 396  |
| 400                       | 600(+0/-5)   | 455  | 386  | 550  | 620  | 16 | 36 | 341  | 381  | 376  | 422  |
| 450                       | 450(+0/-7)   | 519  | 437  | 600  | 670  | 20 | 36 | 373  | 413  | 408  | 454  |
| 500                       | 500(+0/-9)   | 570  | 488  | 660  | 730  | 20 | 36 | 399  | 438  | 433  | 479  |
| 600                       | 600(+0/-9)   | 684  | 588  | 770  | 845  | 20 | 39 | 456  | 495  | 490  | 536  |
| 700                       | 700(+0/-9)   | 783  | 685  | 875  | 960  | 24 | 42 | 505  | 545  | 540  | 586  |
| 800                       | 800(+0/-9)   | 885  | 787  | 990  | 1085 | 24 | 48 | 556  | 596  | 591  | 637  |
| 900                       | 900(+0/-15)  | 996  | 884  | 1090 | 1185 | 28 | 48 | 612  | 651  | 646  | 692  |
| 1000                      | 1000(+0/-15) | 1098 | 984  | 1210 | 1320 | 28 | 56 | 663  | 702  | 697  | 743  |
| 1200                      | 1200(+0/-15) | 1312 | 1181 | -    | -    | -  | -  | 770  | 809  | 804  | 850  |
| 1400                      | 1400(+0/-15) | 1512 | 1382 | -    | -    | -  | -  | 870  | 909  | 904  | 950  |
| 1500                      | 1500(+0/-15) | 1612 | 1482 | -    | -    | -  | -  | 920  | 959  | 954  | 1000 |
| 1600                      | 1600(+0/-15) | 1712 | 1580 | -    | -    | -  | -  | 970  | 1009 | 1004 | 1050 |
| 1800                      | 1800(+0/-15) | 1922 | 1783 | -    | -    | -  | -  | 1075 | 1114 | 1109 | 1155 |
| 2000                      | 2000(+0/-15) | 2122 | 1978 | -    | -    | -  | -  | 1175 | 1214 | 1209 | 1255 |



| MUT2200EL PN 40 EN 1092-1 |              |      |      |     |     |    |    |      |      |      |      |
|---------------------------|--------------|------|------|-----|-----|----|----|------|------|------|------|
| DN                        | L4           | D5   | Di   | D6  | D7  | N  | S  | H    | H1   | H2   | H3   |
| 15                        | 200(+0/-3)   | 84   | 11   | 65  | 95  | 4  | 14 | 156  | 195  | 190  | 236  |
| 20                        | 200(+0/-3)   | 84   | 17   | 75  | 105 | 4  | 14 | 156  | 195  | 190  | 236  |
| 25                        | 200(+0/-3)   | 74   | 24   | 85  | 115 | 4  | 14 | 151  | 190  | 185  | 231  |
| 32                        | 200(+0/-3)   | 83   | 31   | 100 | 140 | 4  | 18 | 155  | 195  | 190  | 236  |
| 40                        | 200(+0/-3)   | 88   | 37   | 110 | 150 | 4  | 18 | 158  | 197  | 192  | 238  |
| 50                        | 200(+0/-3)   | 102  | 47   | 125 | 165 | 4  | 18 | 165  | 204  | 199  | 245  |
| 65                        | 200(+0/-3)   | 114  | 63   | 145 | 185 | 8  | 18 | 171  | 210  | 205  | 251  |
| 80                        | 200(+0/-3)   | 127  | 75   | 160 | 200 | 8  | 18 | 177  | 217  | 212  | 258  |
| 100                       | 250(+0/-3)   | 161  | 99   | 190 | 235 | 8  | 22 | 194  | 234  | 229  | 275  |
| 125                       | 250(+0/-3)   | 187  | 124  | 220 | 270 | 8  | 26 | 207  | 247  | 242  | 288  |
| 150                       | 300(+0/-3)   | 210  | 152  | 250 | 300 | 8  | 26 | 219  | 258  | 253  | 299  |
| 200                       | 350(+0/-3)   | 261  | 195  | 320 | 375 | 12 | 30 | 244  | 284  | 279  | 325  |
| 250                       | 450(+0/-5)   | 319  | 249  | 385 | 450 | 12 | 33 | 273  | 313  | 308  | 354  |
| 300                       | 500(+0/-5)   | 371  | 302  | 450 | 515 | 16 | 33 | 299  | 339  | 334  | 380  |
| 350                       | 550(+0/-5)   | 404  | 334  | 510 | 580 | 16 | 36 | 316  | 355  | 350  | 396  |
| 400                       | 600(+0/-5)   | 455  | 382  | 585 | 660 | 16 | 39 | 341  | 381  | 376  | 422  |
| 450                       | 450(+0/-7)   | 519  | 431  | 610 | 685 | 20 | 39 | 373  | 413  | 408  | 454  |
| 500                       | 500(+0/-9)   | 570  | 480  | 670 | 755 | 20 | 42 | 399  | 438  | 433  | 479  |
| 600                       | 600(+0/-9)   | 684  | 578  | 795 | 890 | 20 | 48 | 456  | 495  | 490  | 536  |
| 700                       | 700(+0/-9)   | 783  | 677  | -   | -   | -  | -  | 505  | 545  | 540  | 586  |
| 800                       | 800(+0/-9)   | 885  | 775  | -   | -   | -  | -  | 556  | 596  | 591  | 637  |
| 900                       | 900(+0/-15)  | 996  | 872  | -   | -   | -  | -  | 612  | 651  | 646  | 692  |
| 1000                      | 1000(+0/-15) | 1098 | 970  | -   | -   | -  | -  | 663  | 702  | 697  | 743  |
| 1200                      | 1200(+0/-15) | 1312 | 1165 | -   | -   | -  | -  | 770  | 809  | 804  | 850  |
| 1400                      | 1400(+0/-15) | 1512 | 1364 | -   | -   | -  | -  | 870  | 909  | 904  | 950  |
| 1500                      | 1500(+0/-15) | 1612 | 1462 | -   | -   | -  | -  | 920  | 959  | 954  | 1000 |
| 1600                      | 1600(+0/-15) | 1712 | 1560 | -   | -   | -  | -  | 970  | 1009 | 1004 | 1050 |
| 1800                      | 1800(+0/-15) | 1922 | 1759 | -   | -   | -  | -  | 1075 | 1114 | 1109 | 1155 |
| 2000                      | 2000(+0/-15) | 2122 | 1954 | -   | -   | -  | -  | 1175 | 1214 | 1209 | 1255 |

| MUT2200EL ANSI 150 |              |      |        |        |        |    |       |      |      |      |      |
|--------------------|--------------|------|--------|--------|--------|----|-------|------|------|------|------|
| DN                 | L4           | D5   | Di     | D6     | D7     | N  | S     | H    | H1   | H2   | H3   |
| ½"                 | 200(+0/-3)   | 84   | 11.3   | 60.3   | 90     | 4  | 15.88 | 156  | 195  | 190  | 236  |
| ¾"                 | 200(+0/-3)   | 84   | 16.9   | 69.9   | 100    | 4  | 15.88 | 156  | 195  | 190  | 236  |
| 1"                 | 200(+0/-3)   | 74   | 23.7   | 79.4   | 110    | 4  | 15.88 | 151  | 190  | 185  | 231  |
| 1¼"                | 200(+0/-3)   | 83   | 31.4   | 88.9   | 115    | 4  | 15.88 | 155  | 195  | 190  | 236  |
| 1½"                | 200(+0/-3)   | 88   | 37.3   | 98.4   | 125    | 4  | 15.88 | 158  | 197  | 192  | 238  |
| 2"                 | 200(+0/-3)   | 102  | 47.3   | 120.7  | 150    | 4  | 19.05 | 165  | 204  | 199  | 245  |
| 2½"                | 200(+0/-3)   | 114  | 63.1   | 139.7  | 180    | 4  | 19.05 | 171  | 210  | 205  | 251  |
| 3"                 | 200(+0/-3)   | 127  | 74.9   | 152.4  | 190    | 4  | 19.05 | 177  | 217  | 212  | 258  |
| 4"                 | 250(+0/-3)   | 161  | 97.3   | 190.5  | 230    | 8  | 19.05 | 194  | 234  | 229  | 275  |
| 5"                 | 250(+0/-3)   | 187  | 121.7  | 215.9  | 255    | 8  | 22.23 | 207  | 247  | 242  | 288  |
| 6"                 | 300(+0/-3)   | 210  | 148.3  | 241.3  | 280    | 8  | 22.23 | 219  | 258  | 253  | 299  |
| 8"                 | 350(+0/-3)   | 261  | 195.1  | 298.5  | 345    | 8  | 22.23 | 244  | 284  | 279  | 325  |
| 10"                | 450(+0/-5)   | 319  | 245    | 362    | 405    | 12 | 25.4  | 273  | 313  | 308  | 354  |
| 12"                | 500(+0/-5)   | 371  | 307.9  | 431.8  | 485    | 12 | 25.4  | 299  | 339  | 334  | 380  |
| 14"                | 550(+0/-5)   | 404  | 337.6  | 476.3  | 535    | 12 | 28.58 | 316  | 355  | 350  | 396  |
| 16"                | 600(+0/-5)   | 455  | 386.4  | 539.8  | 595    | 16 | 28.58 | 341  | 381  | 376  | 422  |
| 18"                | 450(+0/-7)   | 519  | 437.2  | 577.9  | 635    | 16 | 31.75 | 373  | 413  | 408  | 454  |
| 20"                | 500(+0/-9)   | 570  | 488    | 635    | 700    | 20 | 31.75 | 399  | 438  | 433  | 479  |
| 24"                | 600(+0/-9)   | 684  | 587.6  | 749.3  | 815    | 20 | 34.93 | 456  | 495  | 490  | 536  |
| 28"                | 700(+0/-9)   | 783  | 687.2  | 863.6  | 927.1  | 28 | 34.93 | 505  | 545  | 540  | 586  |
| 32"                | 800(+0/-9)   | 885  | 786.8  | 977.9  | 1060.4 | 28 | 41.28 | 556  | 596  | 591  | 637  |
| 36"                | 900(+0/-15)  | 996  | 888.4  | 1085.9 | 1168.4 | 32 | 41.28 | 612  | 651  | 646  | 692  |
| 40"                | 1000(+0/-15) | 1098 | 988    | 1200   | 1290   | 36 | 41.28 | 663  | 702  | 697  | 743  |
| 48"                | 1200(+0/-15) | 1312 | 1187.2 | 1422.4 | 1511.1 | 44 | 41.28 | 770  | 809  | 804  | 850  |
| 56"                | 1400(+0/-15) | 1512 | 1386.4 | -      | -      | -  | -     | 870  | 909  | 904  | 950  |
| 60"                | 1500(+0/-15) | 1612 | 1484   | -      | -      | -  | -     | 920  | 959  | 954  | 1000 |
| 64"                | 1600(+0/-15) | 1712 | 1585.6 | -      | -      | -  | -     | 970  | 1009 | 1004 | 1050 |
| 72"                | 1800(+0/-15) | 1922 | 1786.8 | -      | -      | -  | -     | 1075 | 1114 | 1109 | 1155 |
| 80"                | 2000(+0/-15) | 2122 | 1986   | -      | -      | -  | -     | 1175 | 1214 | 1209 | 1255 |

| MUT2200EL ANSI 300 |              |      |        |       |     |    |       |      |      |      |      |
|--------------------|--------------|------|--------|-------|-----|----|-------|------|------|------|------|
| DN                 | L4           | D5   | Di     | D6    | D7  | N  | S     | H    | H1   | H2   | H3   |
| ½"                 | 200(+0/-3)   | 84   | 11.3   | 66.7  | 95  | 4  | 15.88 | 156  | 195  | 190  | 236  |
| ¾"                 | 200(+0/-3)   | 84   | 16.9   | 82.6  | 115 | 4  | 19.05 | 156  | 195  | 190  | 236  |
| 1"                 | 200(+0/-3)   | 74   | 23.7   | 88.9  | 125 | 4  | 19.05 | 151  | 190  | 185  | 231  |
| 1¼"                | 200(+0/-3)   | 83   | 31.4   | 98.4  | 135 | 4  | 19.05 | 155  | 195  | 190  | 236  |
| 1½"                | 200(+0/-3)   | 88   | 37.3   | 114.3 | 155 | 4  | 22.23 | 158  | 197  | 192  | 238  |
| 2"                 | 200(+0/-3)   | 102  | 47.3   | 127   | 165 | 8  | 19.05 | 165  | 204  | 199  | 245  |
| 2½"                | 200(+0/-3)   | 114  | 63.1   | 149.2 | 190 | 8  | 22.23 | 171  | 210  | 205  | 251  |
| 3"                 | 200(+0/-3)   | 127  | 74.9   | 168.3 | 210 | 8  | 22.23 | 177  | 217  | 212  | 258  |
| 4"                 | 250(+0/-3)   | 161  | 99.3   | 200   | 255 | 8  | 22.23 | 194  | 234  | 229  | 275  |
| 5"                 | 250(+0/-3)   | 187  | 121.7  | 235   | 280 | 8  | 22.23 | 207  | 247  | 242  | 288  |
| 6"                 | 300(+0/-3)   | 210  | 150.3  | 269.9 | 320 | 12 | 22.23 | 219  | 258  | 253  | 299  |
| 8"                 | 350(+0/-3)   | 261  | 195.1  | 330.2 | 380 | 12 | 25.4  | 244  | 284  | 279  | 325  |
| 10"                | 450(+0/-5)   | 319  | 249    | 387.4 | 445 | 16 | 28.58 | 273  | 313  | 308  | 354  |
| 12"                | 500(+0/-5)   | 371  | 299.9  | 450.8 | 520 | 16 | 28.58 | 299  | 339  | 334  | 380  |
| 14"                | 550(+0/-5)   | 404  | 329.6  | 514.4 | 585 | 20 | 28.58 | 316  | 355  | 350  | 396  |
| 16"                | 600(+0/-5)   | 455  | 378.4  | 571.5 | 650 | 20 | 34.93 | 341  | 381  | 376  | 422  |
| 18"                | 450(+0/-7)   | 519  | 427.2  | 628.6 | 710 | 24 | 34.93 | 373  | 413  | 408  | 454  |
| 20"                | 500(+0/-9)   | 570  | 476    | 685.8 | 775 | 24 | 34.93 | 399  | 438  | 433  | 479  |
| 24"                | 600(+0/-9)   | 684  | 571.6  | 812.8 | 915 | 24 | 34.93 | 456  | 495  | 490  | 536  |
| 28"                | 700(+0/-9)   | 783  | 671.2  | -     | -   | -  | -     | 505  | 545  | 540  | 586  |
| 32"                | 800(+0/-9)   | 885  | 766.8  | -     | -   | -  | -     | 556  | 596  | 591  | 637  |
| 36"                | 900(+0/-15)  | 996  | 864.4  | -     | -   | -  | -     | 612  | 651  | 646  | 692  |
| 40"                | 1000(+0/-15) | 1098 | 962    | -     | -   | -  | -     | 663  | 702  | 697  | 743  |
| 48"                | 1200(+0/-15) | 1312 | 1159.2 | -     | -   | -  | -     | 770  | 809  | 804  | 850  |
| 56"                | 1400(+0/-15) | 1512 | 1352.4 | -     | -   | -  | -     | 870  | 909  | 904  | 950  |
| 60"                | 1500(+0/-15) | 1612 | 1450   | -     | -   | -  | -     | 920  | 959  | 954  | 1000 |
| 64"                | 1600(+0/-15) | 1712 | 1547.6 | -     | -   | -  | -     | 970  | 1009 | 1004 | 1050 |
| 72"                | 1800(+0/-15) | 1922 | 1746.8 | -     | -   | -  | -     | 1075 | 1114 | 1109 | 1155 |
| 80"                | 2000(+0/-15) | 2122 | 1938   | -     | -   | -  | -     | 1175 | 1214 | 1209 | 1255 |

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